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MAGAZINE

JUNE 1957
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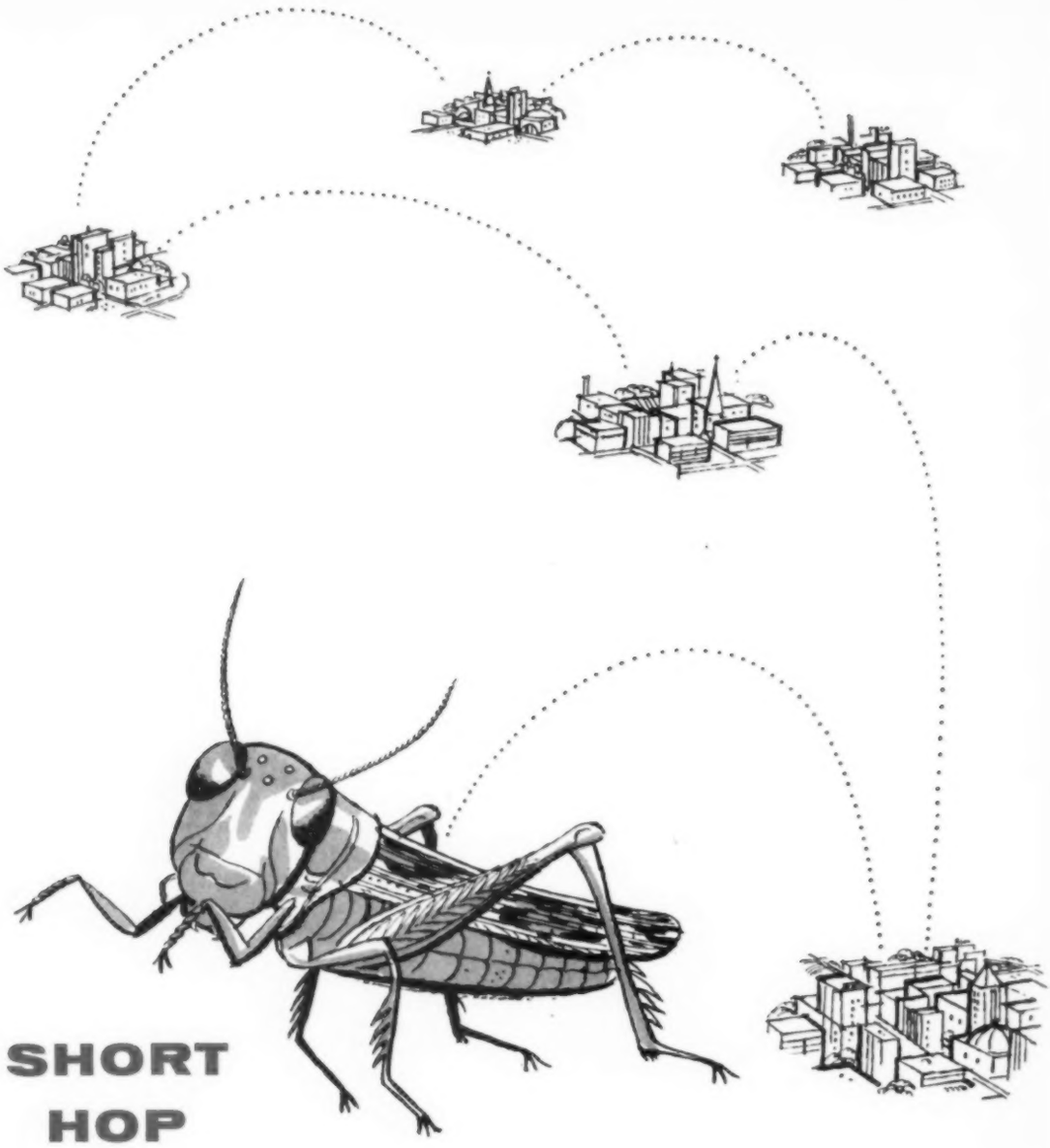

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More local service airlines in the U.S. are lubricated with Texaco Aircraft Engine Oil than with all other brands combined.

Local service airlines are doing a great and growing job providing fast, dependable transportation between the air-conscious smaller cities of America . . . and in acting as feeders for the major airlines. Dependable Texaco quality and service work for most of these lines—improving performance and reducing costs.

This predominant preference for Texaco is easy to understand when you consider that during the last twenty-two years, more scheduled revenue airline miles in the U. S. have been flown with Texaco Aircraft Engine Oil than with all other brands combined.

A Texaco Aviation Representative can give you full information on this exceptional service. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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LUBRICANTS AND FUELS FOR THE AVIATION INDUSTRY

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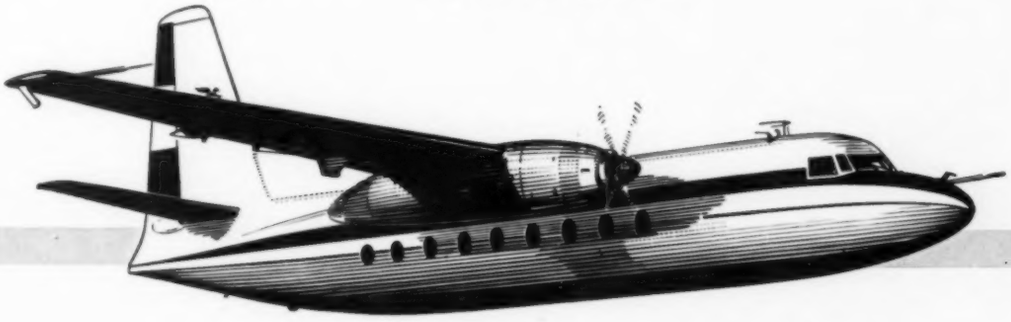

Rolls-Royce Dart prop-jets have flown
over 2,000,000 hours in scheduled airline service

ROLLS-ROYCE LIMITED · ENGLAND · SCOTLAND · CANADA · AUSTRALIA

Fulcher Armstrong, pioneer airman, now owner of the Wichita Falls Air Transport Company which operates the municipal airport.

Built his first plane himself... now he rides herd on one of Texas' busiest airports

Two major air lines, Braniff and Continental, are served by the Wichita Falls Air Transport Company.

Home on the range: Private aircraft from all over the Southwest enjoy the complete line service offered.

Back in the early days of flying, Fulcher Armstrong built his own airplane and flew it successfully. Later he was one of the first to visualize the advantages of using airplanes in the ranching business and commuted from Wichita Falls to ranches in New Mexico. In 1927 he built his own airport to accommodate his aircraft. Three years later, the city of Wichita Falls asked him to convert his facility to a municipal airport. Beginning with this small operation, Mr. Armstrong has built it into one of the finest airports in the Southwest.

At present, the Wichita Falls Air Transport Company offers, on a 24-hour basis, complete line service for private planes and airliners; major and minor repairs on all types of planes up to and including Convairs; charter and ambulance flights, and radio repair. In addition, Armstrong's company operates a pipe line patrol and a flying school.

Phillips 66 Aviation Gasoline is used exclusively. "We find that Phillips 66 gasoline gives dependable performance. That's what counts with our customers," Mr. Armstrong says.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

AIR Report
Significant Trends and News

NATIONAL RENT-A-PLANE SERVICE will be inaugurated next fall by the Hertz Corp. of Chicago, large rent-a-car operator. Walter L. Jacobs, president, said Hertz will issue licenses to selected dealers of Cessna Aircraft Co. to conduct plane rental operations both for "fly yourself" and charter trips. Fifty rent-a-plane outlets are planned the first year, aimed at grossing $2,500,000, with licensees operating similarly to members of the Hertz car rental system. A nationwide credential system will permit a pilot to obtain a universal check-out card, serving also as a credit card, once he has qualified to rent a plane. This card would eliminate need for repeated check-outs at different cities. The new service, to be a wholly-owned subsidiary of Hertz, will rent Cessna 172, 182 and twin-engine 310 models. Only the 172 rental rate has been specified—$1 per hour plus 15 cents per mile "although costs will vary slightly with local conditions." This is the equivalent of about $16 per hour, making a 200-mile trip cost about $32, or 4 cents per seat mile. Jacobs said the potential in plane rental "is very great." His firm operates 1,350 car rental outlets in some 900 cities.

A NEW NAVY CARRIER-BASED FIGHTER is being developed by Chance Vought Aircraft, Dallas, on a new $35,000,000 contract. Its performance will exceed that of the Vought F8U-1 Crusader, the Navy's fastest and holder of the national speed record of 1,015 mph.

THE 30,000th CESSNA AIRPLANE was rolled out in late May, marking the company's 30th year in airframe manufacturing. It was a 4-place Model 172, of which nearly 2,000 units have been produced since its introduction in late 1955. Cessna's first models were 3 and 4-place Models AW, BW and DC-6, built in 1927, but its strength was built on the 4-place Airmaster series started in 1934. Its 1940 T-50 twin launched a World War 2 production that included 640 Canadian Cranes, 33 AT-8's, 4,665 AT-17's and UC-78's and 750 GC-4A gliders. Postwar 2-place Models 120 and 140 accounted for over 7,500 units until the 4-place 170 was introduced in 1948, when Cessna also produced the 5-place 190 series and its LC-126 military counterpart, which accounted for nearly 1,700 airplanes. Since then some 2,800 2-place L-19 liaison planes and 25 O-2 Marine versions have been built. More than 550 twin-engine Model 310's have been built since this 205-mph. business plane was brought out in 1954. Cessna has built 5,100 Model 170's, nearly 3,000 Model 180's and over 1,400 Model 182's.

LOWEST-PRICED JET TRAINER appears to be England's new Miles M-100 "Student," which made its maiden flight last month. F. G. Miles,

FLIGHT MAGAZINE

JUNE, 1957 VOL. 46, No. 6

THIS MONTH'S COVER *is devoted to the local service airline industry, as represented in a photograph showing a Southwest Airways Martin airliner over the bay at San Francisco. Thirteen local service airlines in* 1956 *operated* 194 *airliners, carried* 3,561,242 *passengers* 664,994,000 *revenue passenger miles and served* 458 *cities, of which* 261 *received local air service exclusively. Beginning on page* 51 *is a special section devoted to the local airlines and their development.*

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, *Consultant*; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas—Telephone TAylor 3-6191.

FLIGHT MAGAZINE, June, 1957, Vol. 46, No. 6. Published Monthly. Publication office, P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas. Price 50c single copy. Subscription rates: United States, one year $3.00; two years $5.00; three years, $6.00. Established February, 1934. Entered as second-class matter at the Post Office, Dallas, under the act of March 3, 1879.

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Right now MOHAWK's Convair Fleet is undergoing modification to a 46-seat configuration . . . to become the most attractive and productive short-haul fleet available. This will assure a continuance of our rate of passenger growth which has resulted from public need for and acceptance of MOHAWK service! In 1956 MOHAWK added Erie and Detroit on the west, and Glens Falls, N.Y., on the Boston route . . . in 1957 non-stop service will start between Syracuse and New York City!

NEXT YEAR OUR FINE NEW HEADQUARTERS BUILDING OPENS

at the Oneida County Airport between Utica and Rome, New York — expected to be the most efficient of the modern airline maintenance plants. MOHAWK moves ahead with other scheduled airlines in one of the world's great industries!

MOHAWK
AIRLINES

The Route of the Air Chiefs

EXECUTIVE OFFICES: UTICA, NEW YORK

Ltd., Sussex, its manufacturer, said the cost in Britain is about 13,000 English pounds, or $36,400, including engine, a British-built Blackburn Marbore. Performance includes 2,050-fpm. rate of climb, top speed of over 300 mph. at 20,000 ft., take-off distance of 580 yards to clear a 50-ft. obstacle and 60-knot landing speed. It was designed as both a single and twin-engine aircraft and a new, small Rolls-Royce engine may be used later instead of the Marbore.

VERTOL AIRCRAFT has retained William C. Wold Associates of New York to assist in developing a sales program for the Vertol 15-19-passenger Model 44 commercial transport helicopter. It is available as a cargo carrier, airliner and executive transport.

A NEW 2,600-HP. TURBINE FOR HELICOPTERS, TRANSPORTS AND OTHER SUPPORT AIRCRAFT will be developed by General Electric under a new Navy contract for two types of engines having the same basic power section, one a turboshaft and the other a turboprop. Known as the T64, GE says it will have a power-to-weight ratio of over 3 to 1, with fuel consumption rivaling that of the latest piston engines.

SEVEN DC-4 TRANSPORTS have been offered for sale by Slick Airways, which is converting its 4-engine fleet to DC-6's. In charge is Henry P. Huff, Slick Airways, 3415 Cedar Springs Road, Dallas, Texas.

NEW GLOBE MARK 2 TWO-CONTROL AUTOPILOT has been announced by Globe Industries, Inc., Dayton, Ohio, with CAA approved installations for Cessna 170, 172, 180 and 182 aircraft and Piper Tri-Pacers. The new unit is built around the Globe Gyro Stabilizer, which has been on the market three years, and incorporates a special precision magnetic compass, dampened to correct northerly turning error. This enables the autopilot to lock the aircraft onto a magnetic heading. The complete Mark 2 is priced at $1,350. For those who now own a Globe Gyro Stabilizer, a Mark 2 kit may be added. The kit is priced at $725 and includes heading lock assembly, command console and all installation parts.

FAIRCHILD EXPECTS F-27 PROPJET AIRLINER certification by CAA within 90 days, most of the certification having been performed by the CAA's European office with the Dutch prototype. Fairchild's production line at Hagerstown, Md., is scheduled to deliver its first F-27 by the end of 1957. A total of 25 to 30 F-27's is scheduled to be delivered before June 1, 1958. Latest purchase was by Canada's oldest air service, Wheeler Air Lines, Ltd., St. Jovite, Quebec, which ordered two F-27's. Latest Fairchild tally of F-27 orders shows 80 airplanes, 58 firm, the rest optional. Twelve have been ordered by corporations as business trans-

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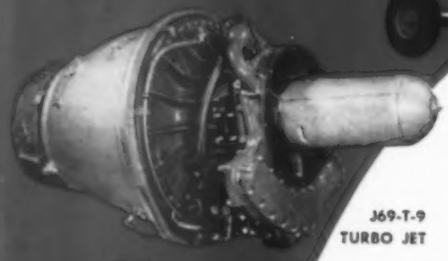
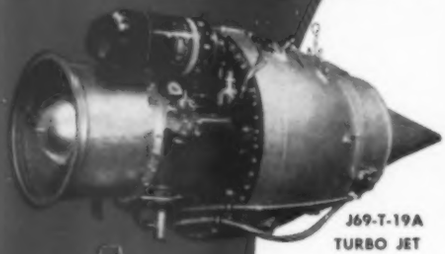
MOHAWK Airlines
THE ROUTE OF THE AIR CHIEFS

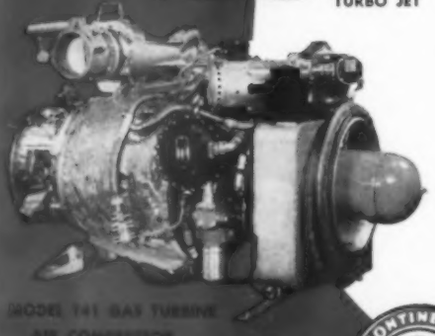
RYAN Q2 FIREBEE
TARGET DRONE



J69-T-9
TURBO JET



J69-T-19A
TURBO JET



MODEL 141 GAS TURBINE
AIR COMPRESSOR

CAE power chalked up another record recently, when a Ryan XQ-2B Firebee jet target drone set unofficial world's records of 53,000 feet altitude and 104½ minutes of flight at Holloman Air Force Base.

The J69-T-19A is one of three gas turbines now in production at CAE. A second version, the J69-T-9, powers Cessna and Temco jet trainers for Air Force and Navy respectively, while the Model 141 air compressor is the heart of the TC-106 mobile starting unit for jet aircraft.

ENGINEERS!

There's a challenging future at CAE for qualified technicians. For full information, address: C. D. Morris, 1470 Algonquin Avenue, Detroit 15, Michigan.

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ports. These buyers include Continental Can, General Tire, Butler Aviation and Banco de Mexico.

NEW HIGH-PERFORMANCE TURBOPROP OBSERVATION AIRPLANE for Army and Marine use will be a Grumman design using the Lycoming T-53 turbine.

DESIGN STUDY CONTRACT FOR A NEW LONG-RANGE AIR FORCE INTERCEPTOR has gone to North American Aviation.

FIRST OF THE MID-1960 JET AIRLINERS has been announced by Vickers-Armstrong of England as the Vickers VC 10, a medium long-range jet for 120-147 passengers.

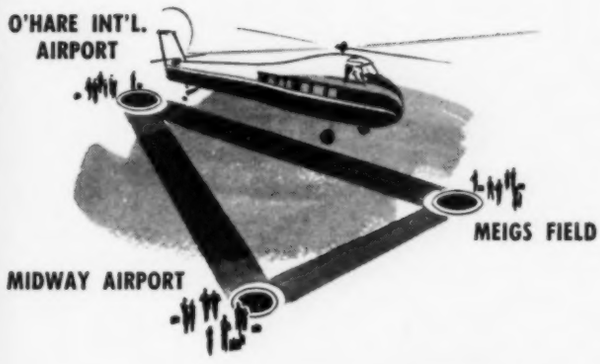
CURTISS-WRIGHT'S NEW HIGH-PERFORMANCE JET ENGINE is the two-spool TJ-38 rated at 12,500 lbs. of thrust and developed jointly by Curtiss-Wright and Bristol of England. Called a "100% airline engine," it operates at temperatures 360 degrees cooler than other large jets.

A NON-STOP FLIGHT OF 1,522 MILES from Guatemala City across Guatemala, Mexico and Texas to Oklahoma City has been made by a standard Aero Commander 560-E for an unofficial new world record. The old record was 1,235 miles for the same category of aircraft, 3,858-6,613-lb. class, and was held by a Russian fighter. The Aero Commander, a new wide-wing model, took off at 6,500-lbs. normal gross weight which included standard capacity of 223 gals. of fuel. It completed the 1,522-mile hop in 8 hrs. 5 mins., averaging 190 mph., and consumed 197 gals. of fuel, having 26 gals. remaining. The pilot was Miss Jerrie Cobb, 26-year-old Ponca City girl who has had wide experience flying for Fleetways, Inc., an international aircraft ferrying service. The standard Aero Commander 560-E is powered by two 295-hp. Lycoming engines, cruises 210 mph. with 70% power at 10,000 ft., and has an economy cruise range of 1,625 miles using 55% horsepower at 10,000 ft. with 30-min. fuel reserve. The National Aeronautics Association supervised the flight as the U. S. agency designated for world record attempts. The new record will not become official until the NAA completes its checking of instruments carried on the flight. . . . **LATEST PURCHASERS OF AERO COMMANDER** business planes include Robert Young, the movie and television star; Catinflas, famous Mexican comedian and star of the movie, "Around the World in 80 Days," and Socony Mobil, whose fourth Commander is now in Venezuela operating out of Caracas.

A NEW TRANSISTORIZED POWER UNIT for ARC receivers is now available from Aircraft Radio Corp., Boonton, N. J., and weighs only 1.6 lbs. It is the DVIOA Dynaverter. Also available from ARC is a brochure on its new "building block" 20-channel T-20 transmitter.

CHICAGO HELICOPTER AIRWAYS

reduces travel time 80% over Chicago's "Triangle of Terminals"



...with CYCLONE 9 powered SIKORSKY S-58 helicopters

Chicago's airports – Midway and O'Hare – are approximately 16 air miles apart. To cover the distance between them by cab takes an hour or more in average traffic. But to travel these miles by Chicago Helicopter Airways takes just 12 minutes – and costs less. Air travelers have been taking full advantage of this fast, dependable service, and of CHA's other suburban passenger and mail schedules, since their inception.

On April 1 this year, the airline expanded its service to include Meigs Field – speeding connections over the triangle of airport and midtown terminals. For this schedule – a long-sought goal –Chicago Helicopter Airways selected big Sikorsky S-58 helicopters, powered by Curtiss-Wright Cyclone 9 engines.

In other cities of the U. S. and the world, as in Chicago, Cyclone 9 power has solved the problems of metropolitan inter-airport and "downtown" travel. The Cyclone 9 is a powerful answer to many special problems and use-requirements in modern aircraft, both civil and military – including transports, patrol and rescue aircraft, sub-hunters and trainers, as well as advanced design helicopters.

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DON R. BERLIN, president of Vertol Aircraft, heads new officers of the American Helicopter Society. Claude O. Witze, Aviation Week, is secretary, and Marvin D. Marks, McDonnell Aircraft, is treasurer, with Harry Lounsbury as executive secretary. Regional vice presidents are M. J. Theodore, Sikorsky; William Cobey, Transcendental Aircraft; D. M. Thompson, Army Transportation Corps; Robert R. Lynn, Bell Helicopter, and Robert J. Sullivan, Hughes Aircraft. Charles M. Seibel, Cessna Aircraft, outgoing president, said the Society's membership gained 24% during 1956 and now exceeds 1,700 members. Awards at the Society's annual meeting last month went to the late Capt. Wayne W. Eggert, Air Force test pilot, who received posthumously the Alexander Klemin Award for his flight test contributions; Robert Suggs of New Orleans, president of Petroleum Helicopters, who received the William J. Kossler Award for practical application of helicopters in the petroleum industry, and to Jean Ross Howard, Helicopter Council, Aircraft Industries Association, and S. Paul Johnston, director of the Institute of Aeronautical Sciences, who received honorary fellowships as outstanding persons in the industry.

FOUR NEW CAA BOOKS useful in aviation planning are now available. "Statistical Handbook of Civil Aviation," "bible" of aviation statistics, costs 55 cents from the Government Printing Office. From the U. S. Department of Commerce, Sales and Distribution Branch, Washington 25, D. C., are available "The Air Commerce Traffic Pattern," at 50 cents, "Federal Airways Air Traffic Activity" at 50 cents and "1960, 1965, 1970 Civil Aviation and Federal Airways Forecasts," at 75 cents.

Airmen's Calendar

June 15—International Convention of the Ninety-Nines, Casa de Palmas Hotel, McAllen, Texas.

June 17—Ninety-Nines' International Air Race, McAllen, Texas-Cuba.

June 17-20—IAS National Summer Meeting, Biltmore Hotel, Los Angeles.

June 25—29th Aviation Distributors and Manufacturers Assn. Meeting, Broadmoor Hotel, Colorado Springs.

July 6-10—11th Annual All-Woman Transcontinental Air Race, San Mateo County Airport, San Carlos, Calif., to North Philadelphia Airport, Pa.

July 13-19—5th Annual Jaycee Air Cruise, Philadelphia to Las Vegas.

July 30-Aug. 2—2nd Annual National Flying Club Convention, Denver, Colo.

Aug. 20-22—Bendix-Scintilla International Ignition Conference, Sidney, New York.

Aug. 30-Sept. 1—Kentucky Jaycee Air Tour. For information, write Frank Savage, Kentucky Jaycees, Fincastle Building, Louisville.

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With an initial order of twelve Caravelle jet transports, AIR FRANCE maintains its policy of operating the most advanced equipment . . . and this policy calls for the specification of Simmonds lightweight Pacitron Fuel Gage Systems. Through past experience and millions of flight miles, AIR FRANCE has proven that Pacitron provides the ultimate in reliable fuel measurement and management.

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Simmonds pioneered the first electronic fuel gage installation over ten years ago. Today's aviation world continues to recognize Simmonds' leadership as "first in electronic fuel gaging."

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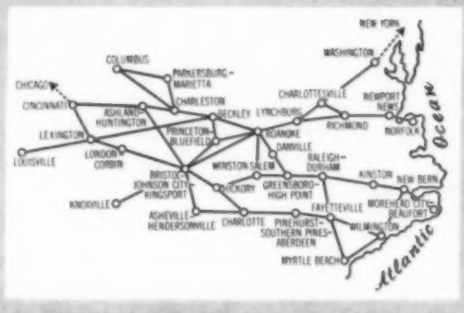
There'll soon be new sights . . . and new sounds . . . in the skies along Piedmont Airlines' Route of the Pacemakers!

Early in 1958, new F-27 Pacemakers are scheduled to go into service on the Piedmont system. Twelve of these splendid planes—manufactured by Fairchild and powered by world-famous Rolls-Royce prop-jet engines—have been ordered by Piedmont and 12 more optioned.

These distinctively beautiful, high-winged transports will usher the age of propeller turbine air travel into the majority of the 50 cities—large and small—served by Piedmont.

The silhouette of the F-27—"the shape of wings to come"—exemplifies Piedmont Airlines' faith in the future and its determination to provide the finest and most modern air transportation available.



PIEDMONT AIRLINES

HOME OFFICE AND OPERATIONS BASE—SMITH REYNOLDS AIRPORT
WINSTON-SALEM, NORTH CAROLINA

FIRST PRIVATE 4-PLACE TWIN-JET MORANE-SAULNIER 760 will go to Dr. Napoleon Dupouy, technical advisor to the president of Venezuela. Beech Aircraft has demonstrated the MS 760 in the U. S. A private order for the fast jet business plane has been placed by the Shah of Iran. Production of the French MS 760 under license in Argentina is planned.

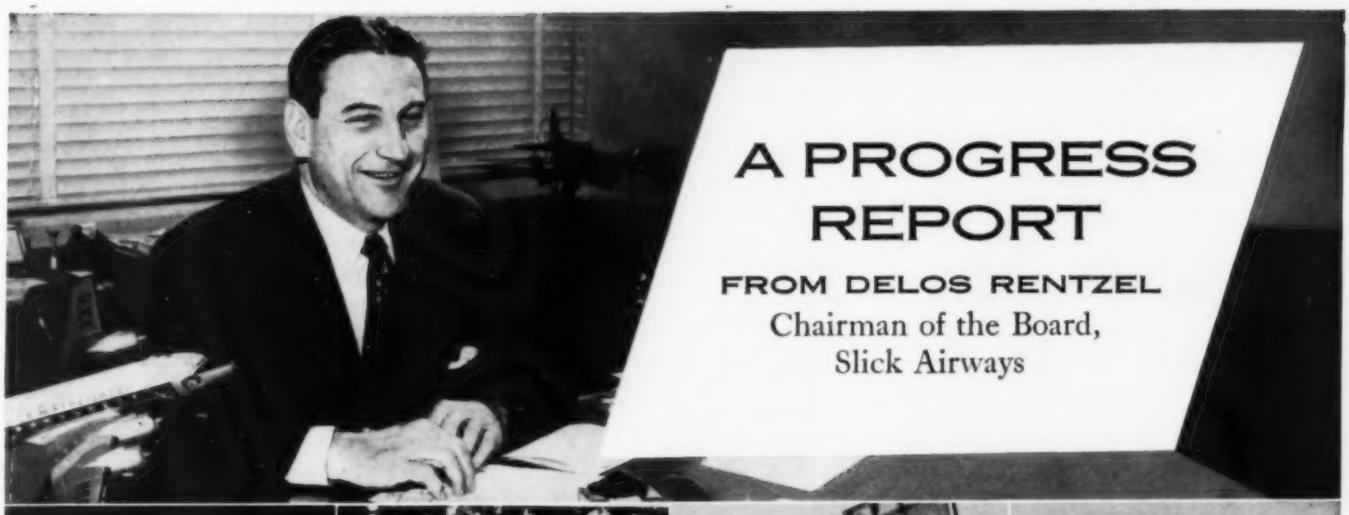
BUSINESS AIRCRAFT DISTRIBUTORS of Oakland International Airport has been named regional distributor for Narco aircraft radios. Henry Von Berg is president.

FOUR IMPROVEMENTS FOR VERTOL H-21 HELICOPTERS have been perfected by Vertol Aircraft. They are a "differential delta-three mechanical stabilization device" for the front rotor which automatically changes blade pitch in turbulent air; an automatic roll rate damper, which is a Sperry rate gyroscope that senses rolling velocity and counteracts it by feeding lateral control into the control system; enlarged vertical tail fins for improved directional stability, and new metal-bonded rotor blades individually interchangeable.

First Global Fliers Honored By Air Force

John H. Harding, Jr. (left), crewman, and Brig. Gen. Erik Nelson (right), pilot, of the "New Orleans," one of the Army's 1924 round-the-world flight of Douglas World Cruisers, are shown with D. W. Douglas, Jr., in recent ceremonies at the Air Force Museum in Dayton, Ohio, where the "New Orleans" is now on permanent exhibit. It was obtained from the Los Angeles County Museum and prepared for shipment by Douglas Aircraft, being flown to Dayton in a Douglas C-124 Globemaster. Man's first flight around the world, the Army flight of Douglas Cruisers took off from Seattle on April 6, 1924, and returned there on Sept. 28, 1924, after covering 27,553 miles in 371 hours and 11 minutes of flying. The "New Orleans" was powered by a 400-hp. Liberty 12 engine, weighed 4,380 lbs. empty as a landplane, cruised at 103 mph., had a 10,000-ft. ceiling and carried 644 gals. of fuel for a range of 2,200 miles. Harding now resides in Dallas, where he operates Harding Devices, Inc., specializing in aircraft valves.

—(Air Force Photo.)



A PROGRESS REPORT

FROM DELOS RENTZEL

Chairman of the Board,
Slick Airways

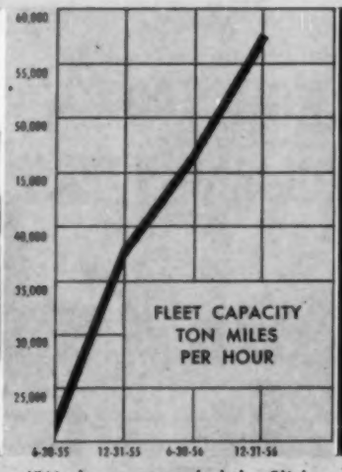
"1956 was a year of accomplishments for Slick Airways... It was the year Robert J. Smith joined us as president.

"It was also the year that we moved our General Offices to Dallas to serve the Nation's shippers better.

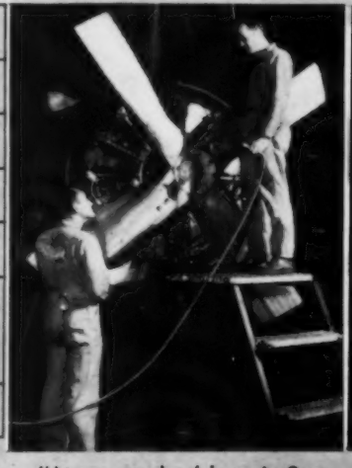
"We instituted our Sky Van program which now makes the air shipment of household goods really practical.

"Our Charter and Contract Division flew nearly 200,000,000 passenger miles...a new record for us.

"In 1956, the Live Cargo Division developed a portable loading ramp that went a long way in helping us set a record for live cargo movement.

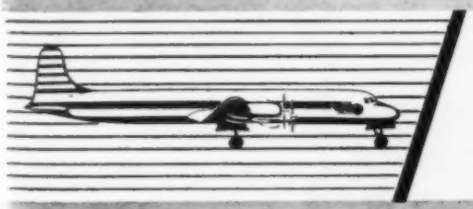


"We have expanded the Slick fleet's capacity with additional DC-6 and DC-4 aircraft; this really 'gave us a lift' as shown by the graph above.



"At our overhaul base in San Antonio, over 400 employees 'Kept 'Em Flying' with their work on R-1300 engines for the Air Force and Army.

"And now in 1957 we embark on SurfAir...coordinated surface-air transport that will bridge over 5,000 hitherto remote communities."



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AMERICAN AIRLINES FLEET NOW 100% EQUIPPED WITH BENDIX IGNITION ANALYZERS!

We are very proud that American Airlines has chosen the Bendix* Ignition Analyzer as the standard equipment for its entire fleet of aircraft. On American's four-engine aircraft the analyzer is permanently installed as airborne equipment. Two-engine aircraft are prepared for portable-airborne analyzer usage.

American Airlines has used the Bendix Ignition Analyzer for quite some time. The decision to prepare the entire fleet of aircraft for use with this analyzer was made after long usage had shown this to be the most suitable equipment for American's requirements.

Major airlines, military services, and corporate aircraft operators have found the Bendix Ignition Analyzer to be a vital and almost indispensable piece of equipment to reduce costs by improving maintenance and operating efficiency. The analyzer plays an important role in reducing en route and turn-around delays, thus improving customer convenience and satisfaction.

The Bendix Ignition Analyzer is a sound investment that will pay for itself within a short period. We would be pleased to provide complete information as to the most convenient and economical analyzer installation for your aircraft.

*TRADE MARK

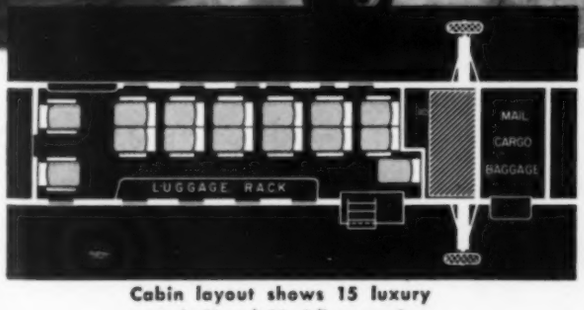
Scintilla Division
SIDNEY, NEW YORK

Bendix
AVIATION CORPORATION

New Vertol helicopter seats 19 passengers, doubles as freighter

For the first time, a large capacity helicopter, the Vertol 44, is available to commercial operators. And it comes with a selection of interiors suited for airline operation, executive transportation, or combination passenger-freight use.

Based on the design of the famous Vertol H-21, which has been flown more than 100,000 hours by the military services of the United States, Canada, France and West Germany, the Vertol 44 offers the versatility and cabin capacity long lacking in civilian helicopter operation.



Cabin layout shows 15 luxury seats in Vertol 44 airliner version.

Engineers, if you are not already working for the government or defense industry, investigate job opportunities with Vertol.

Check these new Vertol 44 features:

- Highest useful load, greatest seating capacity, lowest seat-mile cost in commercial helicopter field. Tandem rotor design allows passengers to sit any place in cabin and eliminates balance problem in placement of cargo.
- Internal capacity, approximately 600 cu. ft. of freight in cargo version. Can carry 2½ tons on external cargo sling.
- Capacity for 19 passengers, using high density seating arrangement. Luxury seats for 15 in airline version with large window next to every seat. Seats fold away for conversion in minutes to cargo configuration.
- Two large doors permit quick and easy loading and unloading; rear door folds down with integral stairway.
- Better high altitude performance with two-speed engine supercharger.

For detailed information on the Vertol 44 write to:

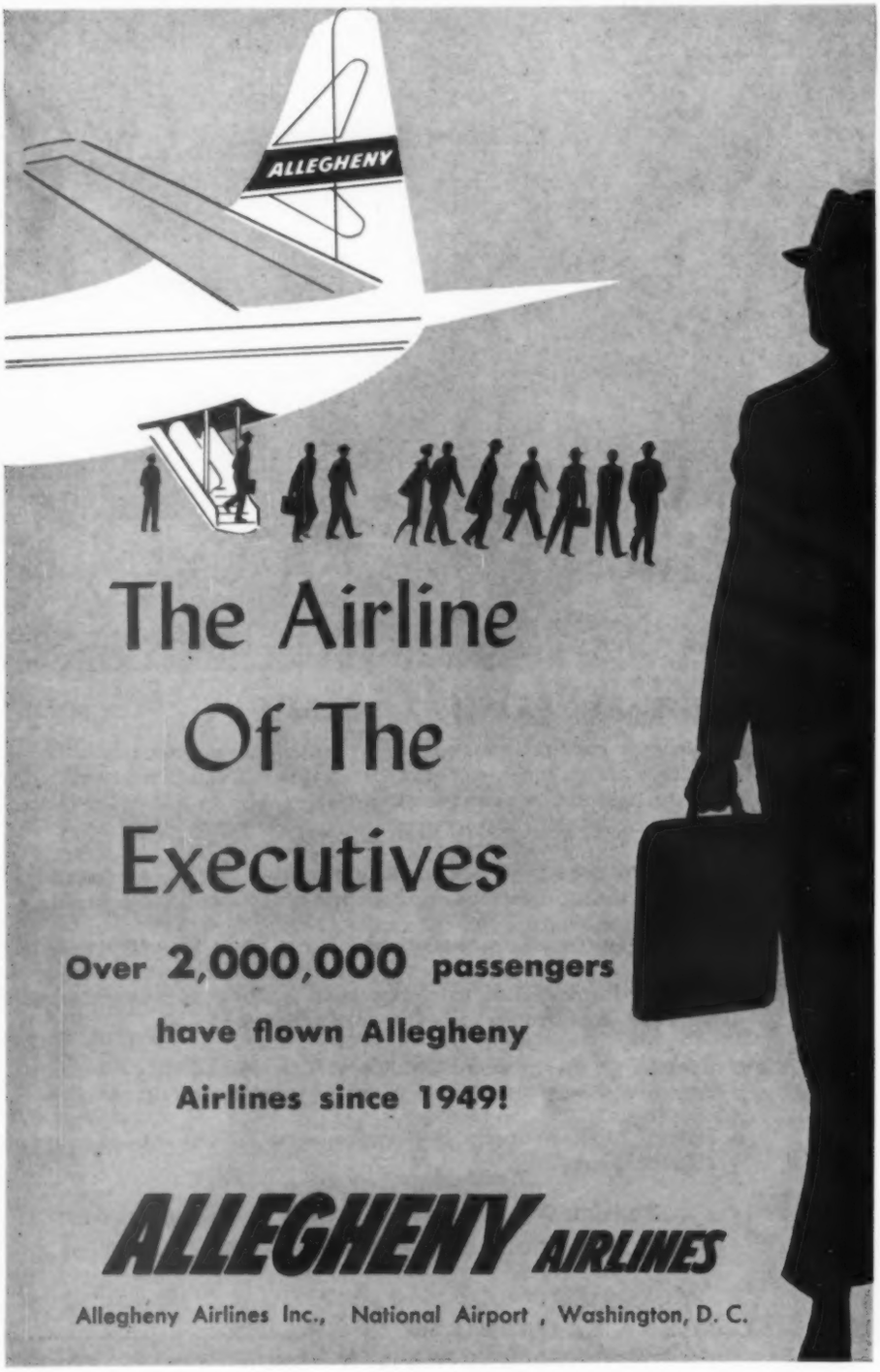
Customer Relations Manager

VERTOL Aircraft Corporation

MORTON, PENNSYLVANIA

POLICY-MAKING CIVIL AIR PATROL LEADERS gathered in Dallas last month from 48 states and 3 territories for meetings. Left to right above (left) are Col. D. H. Byrd, vice chairman; Maj. Gen. W. R. Agee, national commander; Gen. Carl Spaatz, chairman, and Lt. Col. J. E. Earll, Jr., Hensley Field commander, and (right) Gen. N. F. Twining, Air Force chief; Maj. Phyllis Nold, CAP public relations; Col. Erall and Col. Byrd.

—(Civil Air Patrol Photos.)



CAP CADET FLIGHT TRAINING was one of the topics on the agenda at executive sessions of the annual 1957 conference of the Civil Air Patrol's two policy-making groups in Dallas last month. No details were released. Over 250 national leaders attended from the 48 states, the District of Columbia and three territories. The executive board, headed by General Carl A. Spaatz, USAF-Ret., chairman, and Col. D. Harold Byrd, vice chairman, Texas aviation leader and CAP's highest ranking CAP officer, and the national board, made up of 52 wing commanders, conducted the conference. The national CAP commander, Maj. Gen. Walter R. Agee, and his staff from Washington attended. General Nathan F. Twining, U. S. Air Force chief of staff, headed a list of military leaders in attendance. Maj. Hal J. Basham, USAF, national CAP chief of information services, was honored as the first Air Force officer to receive the CAP Award of Honor for his contributions. CAP, which is an Air Force auxiliary, consists of volunteers devoted to the cause of aviation and adequate air power and was cited for many activities including the performance of 77% of all aerial search and rescue last year. Flight training for CAP cadets is a top-policy project for which implementation is being planned. These and mercy missions and disaster relief work of the CAP were praised in a proclamation by Governor Price Daniels honoring the national leaders.

PACIFIC NORTHERN AIRLINES was cited in Seattle recently for its 25-year record of operating without a passenger or crew fatality in regular passenger operations. A. G. Woodley, founder and president, said Pacific Northern carries more passengers in Alaska than any other airline. It operates DC-4's and DC-3's in Alaska and Constellations on its States-Alaska routes.

WEATHER SHIPS RESCUED 47 PERSONS FROM THE NORTH ATLANTIC during 1956, according to the International Civil Aviation Organization. Nine weather ships are operated in the ICAO North Atlantic

Ozark Air Lines Reports:

BENDIX FLUSH LOOP ANTENNA INCREASES SPEED, REDUCES PRECIPITATION STATIC 50%!

Ozark Air Lines specified the Bendix* Flush Loop Antenna in converting their fleet of DC-3's to Hi-Per modifications. And here's what Captain J. A. Wiggins, Superintendent of Flight Operation for Ozark, reports:

"Our Bendix Flush Loop Antenna installations have eliminated 50% of the precipitation static we formerly encountered. This is, of course, very important in our type of operation since a good portion of our small airport approaches are Homing facilities and it is necessary to use ADF. This is one of the modifications we are doing to our aircraft which results in an increase in speed and a decrease in operating cost."

The newest development in ADF antennas, the LPA-70, can be flush mounted on the top or lower surface of any aircraft. And because there are no projections or exposed areas, precipitation static is greatly reduced and drag eliminated entirely.

For complete information regarding performance characteristics and installation data, write directly to Bendix Radio, Aviation Electronic Products, Baltimore 4, Maryland. Or contact: West Coast—Bendix Radio, 10500 Magnolia Boulevard, North Hollywood, California; Export—Bendix International, 205 East 42nd Street, New York 17, New York.

*REG. U. S. PAT. OFF.

Bendix Radio Division

Bendix
AVIATION CORPORATION

THE *Beaver* in the Antarctic

Ready to go anytime under extreme conditions of cold, de Havilland Beavers were chosen by the Governments of Australia, Chile, Great Britain and New Zealand for their operations in the South Polar Regions during Geophysical Year.

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4-57

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PIEDMONT Airlines

Lake Central AIRLINES

WCA WEST COAST AIRLINES

SWA SOUTHWEST AIRWAYS

OZARK Air Lines

ON THE OCCASION OF THE 8th ANNUAL LOCAL SERVICE ISSUE

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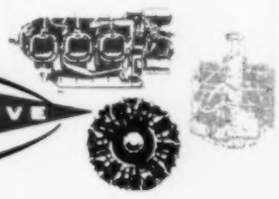


DALLAS AIRMOTIVE INC.

6114 FOREST PARK ROAD FLeetwood 1-3771 • DALLAS, TEXAS

NEW SOUTHWEST AIRMOTIVE HEADQUARTERS for general offices and its distributor sales division will be the old airlines terminal at Love Field in Dallas, (above) when the new terminal is opened. Southwest is building a new $4,000,000 business flying base near the old terminal.

NEW WINGS FOR THE WEST

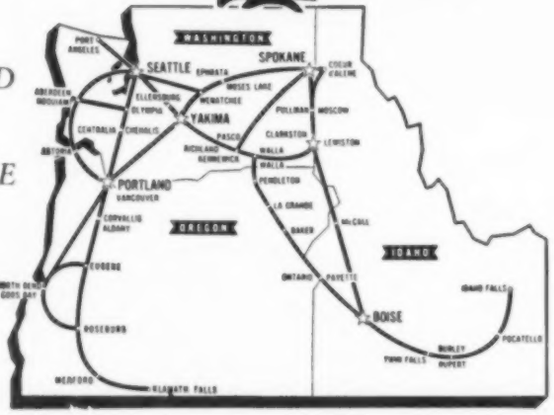
Soon, West Coast Airlines will again pioneer a new era in local service. The first F-27 turbo-prop aircraft to be delivered to a local service airline will go to WCA.

West Coast Airlines — first in scheduled flight among the nation's 13 local service airlines — has begun its second decade of service to the burgeoning Pacific Northwest.

The local service airline industry has come of age in the vital Pacific Northwest.

WEST COAST AIRLINES

SCHEDULED LOCAL SERVICE



ocean station network. They are supplied or paid for by most of ICAO member nations whose airlines fly the North Atlantic. None of the 47 rescued were passengers of scheduled civil aircraft; most were involved in surface vessel emergencies. The weather ships steamed 28,078 miles on search and rescue missions, gave medical assistance to ships at sea 15 times, received 34 aviation and 869 maritime SOS messages, made radio contact with 40,449 aircraft and 6,631 ships, assisted aircraft with 34,154 radar fixes, 16,874 non-scheduled radio beacon transmissions and 600 direction-finding bearings. Main purpose of the ships is for weather observation and reporting.

ARMY GROUND FORCE USE OF THE TWIN-JET CESSNA T-37A TRAINER in photo reconnaissance, observation and other missions is to be studied with three T-37's borrowed from the Air Force for about two years. Army pilots began transition training in early June at the Cessna factory in Wichita.

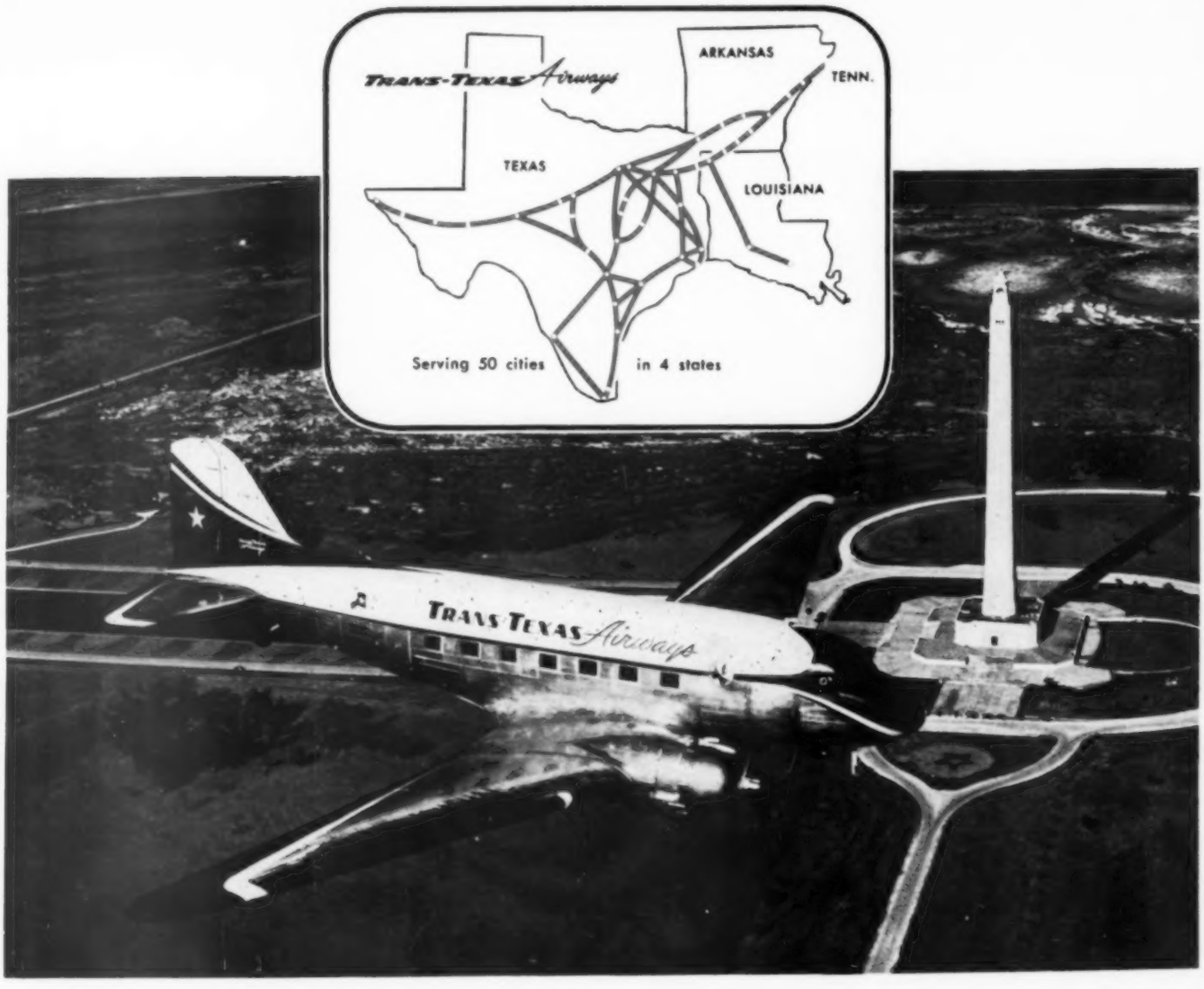
THE TRANSISTORIZED BENDIX PB-20B AUTOMATIC FLIGHT CONTROL SYSTEM, designed as an integral part of Lockheed 1649A Starliner transports, was introduced in scheduled operations on June 1 by Trans World Airlines on its jetstream luxury service between Los Angeles and New York and New York and Paris. Fuel savings, precise navigation and approaches and improved passenger comfort are claimed for the system, which features continuous self-adjustment.

MISS SPIRIT OF ST. LOUIS, the world's ideal airline stewardess, is Jo Ann Borseth of Chicago, who has been flying two years for North Central Airlines, a local service carrier. She was selected from 39 finalists chosen from 1,200 stewardesses representing airlines all over the world. The contest was sponsored by the Airlines Stewards and Stewardesses Association and Warner Brothers, producers of the movie, "Spirit of St. Louis."
—(North Central Airlines Photo.)

BETTER SERVICE...
THANKS TO
120 PARTNERS

UNITED
AIR LINES

We're proud of our partners in service: the 120 connecting carriers who route many of their passengers over United Air Lines central Main Line Airway. This outstanding interline co-operation makes travel and shipping easier, smoother and often cheaper for people throughout the entire country. It is our aim to make this co-operation work even harder, so that service to all of our customers can constantly improve. We know our 120 partners share this aim with us.



AT MANY AIRPORTS

Trans-Texas Makes It Mobil

FLYING that well known workhorse the DC-3 to 50 cities throughout four states, our good customers Trans-Texas Airways logged 6,304,000 trouble-free miles last year.

At five airports along this route Trans-Texas Airways planes are serviced and refueled with Mobilgas Aircraft, Grade 91/98. To meet the needs of different types of planes Mobilgas Aircraft has been improved consistently and remains first choice with experienced pilots today, for top-flight performance. Why don't you make it Mobil?

Manufacturers of

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Grade 91/98
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Grade 115/145

Mobiljet JP4 Fuel

All grades of Mobiloil Aero

Magnolia Petroleum Company

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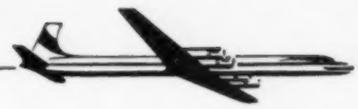
NEW!



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the DC-7C — world's fastest, finest airliner

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New kit improves the range, safety, performance, payload and economy of your airplane with no increase in horsepower!

Now available for the first time to DC-3 owners is a completely integrated modification kit that "maximizes" the airplane's performance.

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And these sharp eyes cast an admiring glance at Uncle Sam's local service carriers, who book so many overseas passengers on Pan Am. The frequency and dependability of these carriers has immeasurably broadened the air horizons for all Americans.

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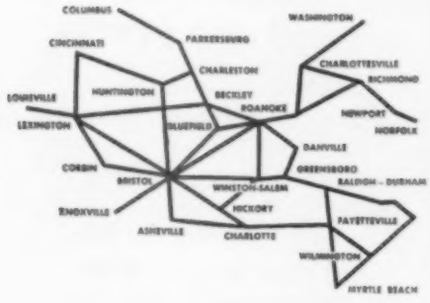
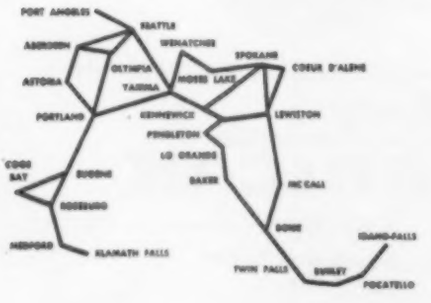


PIEDMONT AIRLINES

SOUTHWEST AIRWAYS

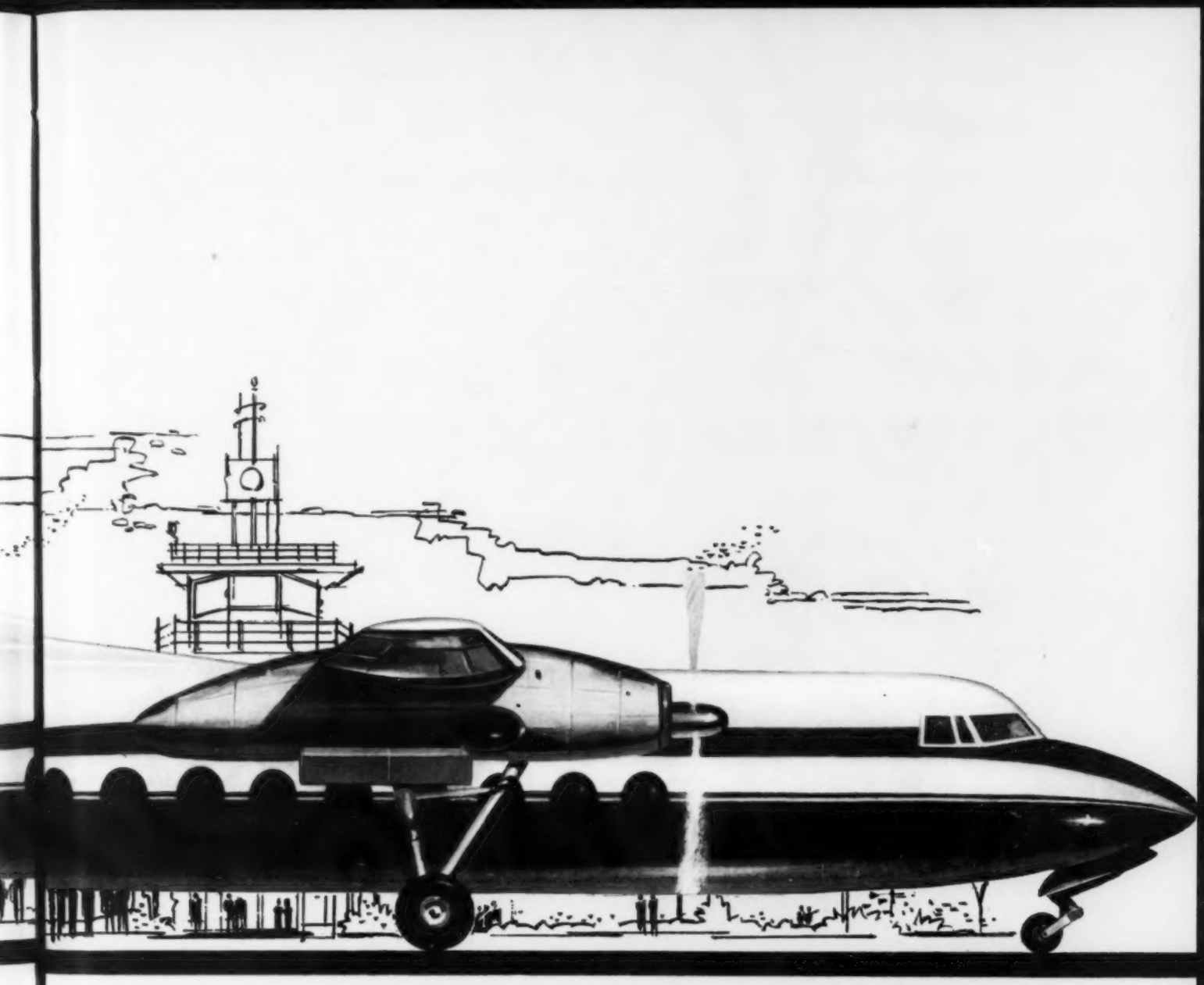


WEST COAST AIRLINES

PARTNERS

A new partnership has been formed to introduce to Main Street, U.S.A., the modern, fast, comfortable, dependable air transportation it needs for continuing growth.

The partners are the nation's progressive local service airlines and Fairchild. Their common interest is the Fairchild F-27, twin propjet-powered 40 passenger, pressurized transport to make its appearance on local service air routes next year.



IN AIR PROGRESS

Development of the F-27 is making it possible for local airlines to plan long-deferred re-equipment programs around an aircraft that promises to start them well down the road toward:

Drastic reductions in break-even levels

Marked improvement in net operating results

Lower maintenance costs

Increased traffic stimulation • Greater self-sufficiency

For such local air lines as Bonanza, West Coast, Frontier, Piedmont and Southwest, 1958 will be an important year of transition – from costly, out-moded equipment to economical modern, in-step-with-the-times aircraft. Modern in propjet speed, vibration-free, restful flight, pressurized and air conditioned comfort.

Fairchild is proud of its new partnership, of its contribution to a vital, dynamic air transportation system indispensable to fast, modern communications.

FAIRCHILD F-27

FAIRCHILD ENGINE AND AIRPLANE CORPORATION, HAGERSTOWN 15, MARYLAND

SAC Silver Jubilee Newsreel

BY JACK PATTON

TALKIN TEXAS!
NOW...BUSINESS, NOT BOMBS.
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AFTER WINNING A WW II CITATION FOR USAF ENGINE O'HAULS, WE LOOKED TO NEW & PEACEFUL HORIZONS
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EXEC VP GEORGE JALONICK LAUNCHED A NEW DIVISION TO SELL PARTS & ACCESSORIES
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AC, Aeroquip Corp., A. P. Parts Co., Bendix Products Div., B. F. Goodrich, Delco-Remy, Eclipse-Pioneer, Glidden Co., Gould Nat'l Batteries, Grimes Mfg. Co.

Introducing new products and new ideas to fixed base operators throughout the southwest, SAC's famous "Flying Salesmen" covered the market in Luscombe Silvaires for several years after WW II. Here, VP Paul Kennedy (in plane) briefs a 1947 sales mission for his young pioneers in aviation distribution.

Hamilton Standard, Lycoming, MacWhyte Cable Co., Montrose Div. (Bendix), New York Air Brake, Pacific Div. (Bendix), Packard Electric, Pesco

In close harness with manufacturers, George Jalonick works to further improve his "services of supply" to airlines and overhaul firms. At immediate right, Sales Mgr. Don Morse of Bendix Scintilla (standing, left) joins him to check SAC's Scintilla inventory records. The other photo shows Jalonick receiving the Dallas Jaycee Wright Brothers Medal for community achievement.

Pioneer Central Div. (Bendix), Pratt & Whitney Aircraft, Red Bank Div. (Bendix), Scintilla, Skinner Div. (Bendix), Utica Div. (Bendix), and Willard Batteries

1932 — A QUARTER CENTURY OF LEADERSHIP — 1957

Southwest Airmotive Co.

LOVE FIELD DALLAS

DIVISIONS: KANSAS CITY, KANSAS / DENVER, COLORADO

Just among ourselves

A Hard Row to Hoe

TECHNICAL development in aviation has always been jumps ahead of the minds of men in government who are charged with the official policies around which economic development revolves.

This is especially true right now; we are deep within one of those oft-repeated cycles in which the airplane and its component equipment have moved so far out in front of government machinery and policies a crisis has developed. This time it is a facilities crisis, on the ground and in the air.

There is no hope whatsoever of a speedy issue out of aviation's present afflictions. Last month Mr. Edward P. Curtis, President Eisenhower's special assistant for aviation facilities planning, turned in his report. It is impossible to read this monumental document and fail to visualize the hard row we have to hoe before the seed is planted, the tender plants nurtured to maturity and the crop harvested.

All of us can breathe one sigh of of relief. There should be no more reports. We are up to our neck in reports. Everybody and every agency has made a report. What we need now is some fast moving debate and one helluva lot of action.

And it is in the action department that the aviation industry can and must come to the rescue. There are so many well-informed men on aviation in the present Congress the stage is set for every conscientious individual, organization and enterprise in aviation to make known to the Congress that the Curtis recommendations should be implemented at the earliest possible moment.

This does not necessarily mean that you have to rubber-stamp everything in the Curtis report. In any undertaking of this magnitude there's bound to be points of disagreement and a seeking for modification on certain scores. That's the American way. And there's bound to be a bunch of self-seeking, small-minded noisemakers whose stock in trade is to grandstand around just for the sake of attracting attention. Like the poor they seem always to be with us. But we can not afford at this time a big national rhubarb that generates more heat than light.

There is only one way to implement the Curtis report. Get the word to Congress through the hundreds of thousands of aviation constituents that action must come this session. Complacency of the people in aviation is largely responsible for the mess we find ourselves in at the moment. To sit back now and assume that the job will be done by someone else will be the folly of the age. In these days of big government and big pressure groups and too few hours in the day for the workload, nothing is automatic.

We have now entered the political and economic phase of the attempt to modernize our aviation facilities. We will not get modernized facilities unless you let your Congressmen know you want them. There are too many people already pounding on his door for other things.

A Public Service Industry

WRITING for the Journal of Air Law and Commerce in the Spring of 1956, the Honorable Joseph P. Adams of the Civil Aeronautics Board (his term expired December 31, last) had this to say about the local service airlines:

"The contribution by our local service airlines to the over-all public welfare of the United States has in recent years been so conclusive as to be no longer debatable. The volume and quality of service afforded the 3,000,000 passengers they are transporting in the current year, primarily to and from the medium and small size communities of the United States, leaves no doubt that the local service air carrier industry is in the truest sense of the term a public service industry."

In this issue FLIGHT MAGAZINE presents our eighth annual review of local air service progress. Both the problems and the accomplishments of these amazing carriers are closely scrutinized and analyzed. Additionally, something of the promise of local air service in the future is touched upon in the light of solutions to the many problems they now face.

Joe Adams is no longer on the Civil Aeronautics Board; but his intimate knowledge of and deep interest in the expansion of scheduled air transportation to the medium and small-size towns has left an imprint on the present Civil Aeronautics Board as did the thinking of member Josh Lee, another strong advocate of local air service.

There is a real conviction within the local air service ranks that the present CAB members are completely objective and will soon come up with the solution to most of the problems that have dogged this vigorous group of operators for the past eleven years during which not one penny of profit has been passed on to investors.

We believe with these carriers that the day is not too far distant when the Civil Aeronautics Board will start devoting more of its time and attention to local air service, especially in working out an intelligent formula for subsidy and mail rate payments, finally admitting that no other form of government regulated public service enterprise in the annals of U. S. history has ever been treated so shabbily as the local service airline industry during the past ten years.

To Be Continued

THE venerable old Douglas DC-3's long and colorful history of dependability was crowned anew on April 21, 1957, when a Frontier Airlines DC-3 carrying 23 passengers and crew was slammed against a rocky crag in a down draft while battling stormy turbulence 55 miles north of Phoenix. The impact tore off 12 feet of its left wing, but Pilots Dale Welling and Herman Wrasse just kept on flying, expertly completing their trip to Phoenix. You can't replace the DC-3!

AIR REPORTS

(Continued from page 20)

DR. HARVEY CASEBEER, prominent Montana airman and one of the founders of the Flying Physicians Association, was killed in an automobile accident near Butte, Montana, April 27, 1957. He had served as a member of the Aviation Development Advisory Committee to the CAA administrator in Washington and was active in FPA, CAP, Montana Aeronautics Commission and the Montana Pilots Association.

WILEY R. WRIGHT, chief, industry and interagency liaison staff, Civil Aeronautics Administration, Washington, D. C., has tendered his resignation to CAA Administrator James T. Pyle after 31 years of service. He has worked under every administrator or director since the first Bureau of Air Commerce days. A native of Georgia, Wright has served in many capacities out in the field and held top position on the staff level in Washington, especially on aviation development matters and most notably in recent years on such projects as the Air ROTC program.

Some clarification came about last month in the matter of Small Business Administration **LOANS TO AVIATION OPERATORS FOR HANGAR CONSTRUCTION** when CAA Administrator James T. Pyle announced that after consultation in Washington with SBA officials a memorandum went out to all regional SBA directors under date of May 3, 1957. The SBA memorandum follows:

"LOANS FOR AIRCRAFT HANGARS"

"The following statement has been received from the Civil Aeronautics Administration:

" 'The growth of general aviation is being seriously retarded by the acute need for more hangar space for aircraft — both company and privately owned.

" 'People quite understandably will not invest several thousand dollars in an airplane if there is no hangar space available and it has to be tied out in the weather.

" 'This situation, perhaps more than anything else, has hampered the growth of grassroots aviation and has caused a steady decline in the number of small airports, fixed base operators, flight instructors and flight schools.

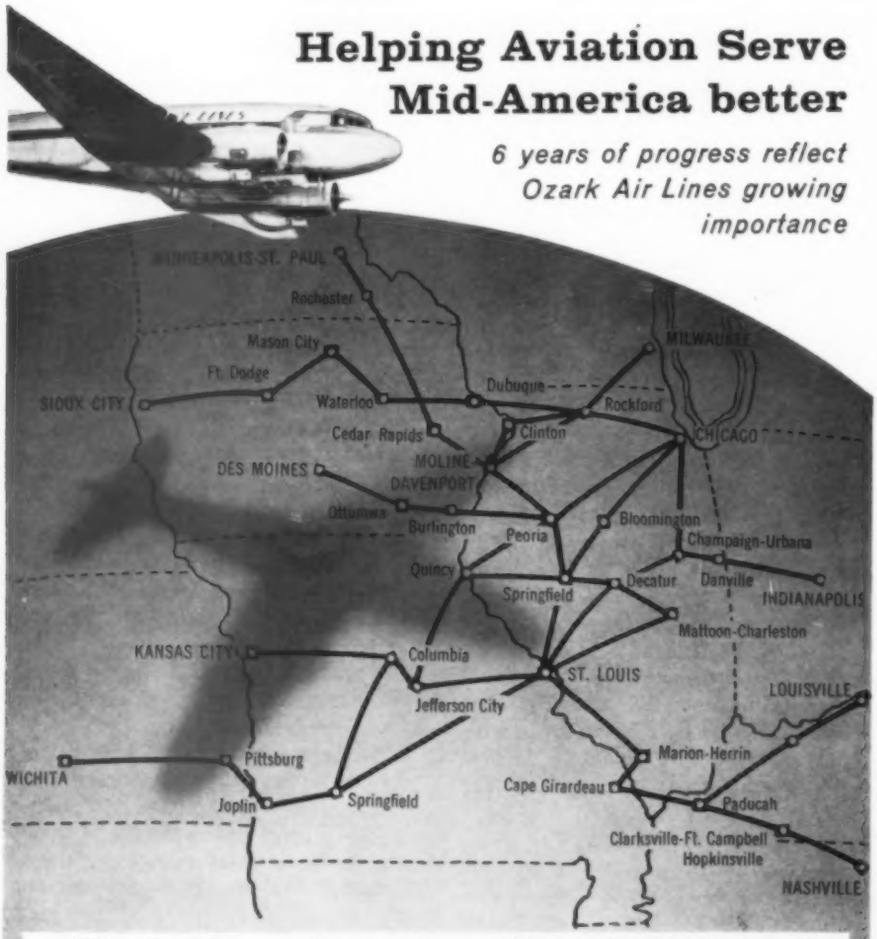
" 'Experience has shown that where new hangar space is made available it is quickly contracted for and it generates airplane sales and increased flight activity.

" 'The dominant role that aviation plays today in the economy of the country and in the defense of the nation makes it imperative that the broad base of general aviation grow to meet the ever increasing demand of the airlines, the business fleet and the military.

" 'Making adequate hangar space available will go far toward making

Helping Aviation Serve Mid-America better

6 years of progress reflect Ozark Air Lines growing importance



Adding more flights . . . serving more cities . . . modifying its fleet for still greater safety, comfort and economy . . . all are a part of the progress at Ozark during the past six years. Much of this progress was in the year just past. The number of passengers carried increased 30% in 1956. More than 5,000,000 miles were flown, exceeding 1955 mileage by 27%. Last year, too, Ozark began handling freight . . . carried well over a million pounds. New routes include service to Cedar Rapids, Rochester, and Minneapolis-St. Paul. Working closely with connecting air lines, Ozark's constant endeavor is to bring better service to its cities and passengers.

OZARK AIR LINES

THE BUSINESSMAN'S AIR LINE SERVING MID-AMERICA

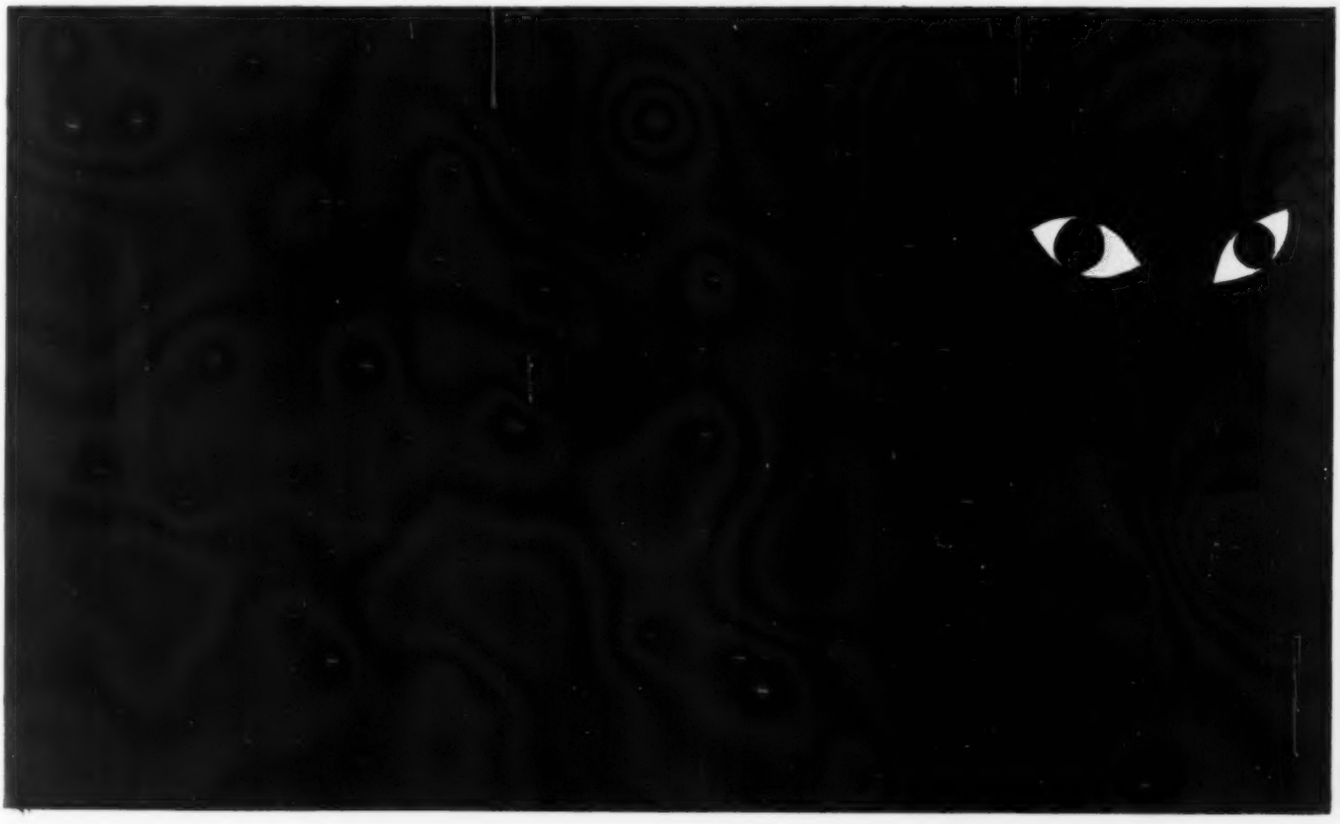
General Offices: *Lambert Field, St. Louis, Missouri*

PASSENGERS • AIR MAIL • AIR EXPRESS • AIR FREIGHT

SHELL OIL HANGS CUSTOMER — It's all in fun but Robert F. (Bob) Schmidt, Manager of the Tucson Airport Authority, is "hung" on the eve of his election to the presidency of the American Association of Airport Executives. Doing the "honors" are, left to right, Kal Philips, J. Walter Thompson Company of Los Angeles, Neby Nebeker, Shell's district manager, Tucson, and Hugh Harvey, Shell Oil Company of New York.

EASTERN SEABOARD OR TEXAS GRASSLANDS *Esso is there . . . at 600 airports from Maine to Texas!* How convenient business and pleasure flying has become! Now, when you plan a trip, the least of your worries is having the plane properly serviced – thanks to the special effort Esso Aviation Dealers are making to save you time and trouble. Your Esso Aviation Credit Card, for instance, allows you to charge not only gasoline, oil and lubrication, but tire and battery service, landing fees, overnight in-transit storage and most minor emergency repairs as well. Enjoy your next trip . . . land where there is an Esso Aviation Dealer.

FREE TO PILOTS! See your nearby Esso Aviation Dealer for your free copy of "The Esso Co-Pilot"–a complete directory of Esso Aviation Dealers.



Local Service Airlines Interline Traffic Exchanged with Trunk Airlines during 1956

Traffic from Local to Trunk Airlines				Traffic from Trunk to Local Airlines		
Number of Passengers	Revenue	Revenue per Passenger	Local Airline	Number of Passengers	Revenue	Revenue per Passenger
74,204	$ 1,860,238	$25.07	Allegheny	119,993	$ 1,190,376	$ 9.92
22,325	934,991	41.88	Bonanza	36,648	536,455	14.64
36,921	1,125,643	30.49	Central	37,512	482,960	12.87
31,060	1,610,842	51.86	Frontier	67,428	1,119,567	16.60
38,936	984,226	25.28	Lake Central	47,989	541,795	11.29
79,441	1,713,477	21.57	Mohawk	90,872	1,065,913	11.73
115,486	3,559,468	30.82	North Central	259,595	2,478,665	9.55
90,256	2,623,663	29.07	Ozark	190,699	1,824,232	9.57
107,639	2,300,591	21.37	Piedmont	130,792	1,608,499	12.30
55,099	1,447,476	26.27	Southern	72,190	706,052	9.78
55,898	2,266,783	40.55	Southwest	67,884	728,865	10.74
56,794	1,835,506	32.32	Trans-Texas	75,850	973,694	12.84
26,710	1,208,772	45.26	West Coast	40,647	428,471	10.54
790,769	$23,471,676	$29.68	Totals	1,238,099	$13,685,544	$11.05

—(Ray & Ray Compilation)

Dynamic Growth

...FRONTIER AIRLINES and the WEST!

Growing with the new, expanding West, here's how Frontier Airlines now stands among 13 Local Service Airlines

No. 1 *in Penetration of Population (passengers per capita)*

No. 1 *in Airfreight Tonnage (40% of all Air Freight carried by Local Service Airlines)*

No. 1 *in Mail Tonnage*

No. 2 *in Percentage of Schedule Miles Completed*

No. 2 *in Utilization of Aircraft (hours per day)*

No. 2 *in Load Factor (available ton miles used)*

FAL

fly FRONTIER AIRLINES

CONNECTING WITH ALL TRANSCONTINENTAL AIRLINES

this growth possible.'

"In this connection, as stated in previous circular letters, SBA loans may be made to construct hangars when they are operated as a part of a business project such as aircraft servicing, petroleum products sales, flight schools or other similar activities, when usual credit standards for regular business loans are met. However, the restriction against loans for investment applies when the proceeds are to be used for the construction of hangars strictly for rental purposes by persons or groups not associated with an allied business such as aircraft services, air field operations.

"We were informed that relatively few hangars are built by outside investors for rental only but usually are constructed as an aid to other business activities involving aircraft. If there is any doubt as to an applicant's eligibility the matter should be referred to Washington for a ruling.

"It will be the policy of this Administration to give, within its authority, and consistent with its credit policies, every possible consideration to applications for loans which will contribute to the further growth of general aviation in the country."

LOPEZ-GRACE AVIATION, INC., which recently moved from Miami to Broward International Airport at Fort Lauderdale, has completed an Aerovias Condor de Colombia C-46 and recently completed overhaul and modification of a Cinta Chilean Airlines DC-4B. Oswaldo Lopez of Bogota and Coral Gables is president of Lopez-Grace. He and Lee E. Wagner, Broward Airport manager, predict this airport will become a major overhaul base for Latin American airlines.

INTRODUCTION OF BEECHCRAFT TRAVEL AIR, new 4-place, 200-mph. small twin, is now expected in late summer or early fall.

LOCAL SERVICE AIRLINES Comparison of Break Even Needs (Cents Per Revenue Mile) 1955-1956

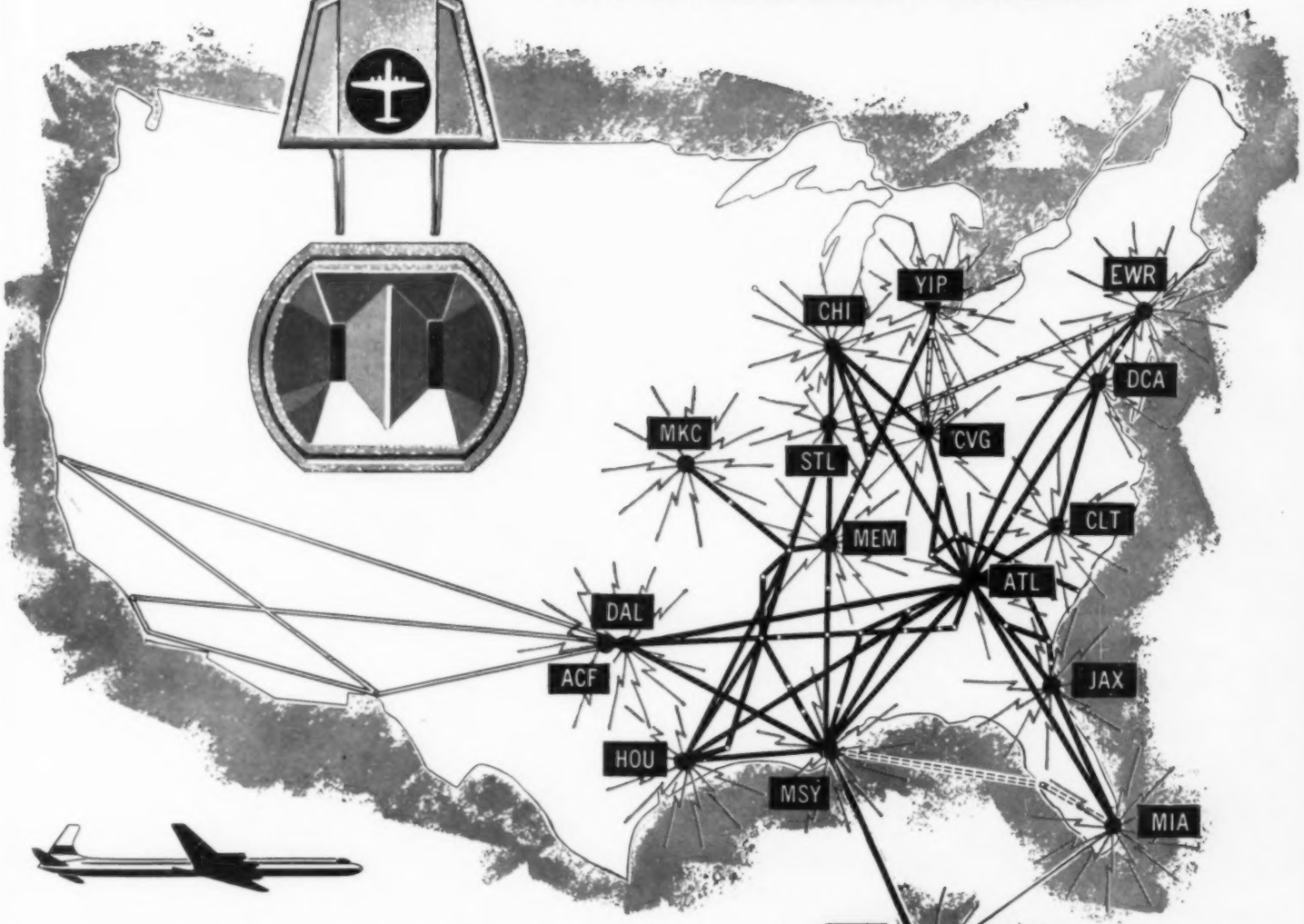
Carrier	1955	1956	Decrease
Allegheny	39.44	42.27	(2.83)
Bonanza	40.48	39.72	0.76
Central	79.24	76.05	3.19
Frontier	54.08	43.71	10.37
Lake Cent.	64.99	56.60	8.39
Mohawk	20.29	30.10	(9.81)
North Cent.	22.96	18.38	4.58
Ozark	46.61	49.86	(3.25)
Piedmont	27.17	35.38	(8.21)
Southern	50.56	51.00	(0.44)
Southwest	26.43	41.57	(15.14)
Trans-Texas	53.37	44.93	8.44
West Coast	49.45	45.15	4.30
Average	41.49	41.21	0.28

LOCAL SERVICE AIRLINES Number of Employees Year 1956

Carrier	Beginning of Year	End of Year	% Increase
Allegheny	601	686	14.1
Bonanza	206	315	6.4
Central	367	406	10.6
Frontier	624	680	9.0
Lake Cent.	322	353	9.6
Mohawk	478	604	26.4
North Cent.	831	977	17.6
Ozark	537	693	29.1
Piedmont	767	843	9.9
Southern	435	482	10.8
Southwest	384	417	8.6
Trans-Texas	548	680	24.1
West Coast	417	428	2.6
Totals	66.07	75.64	14.5

Delta makes connections

with 54 Trunk, Local Service and Overseas Air Lines



56 Connection Cities in U.S. and Caribbean

All but four cities on the Delta system are "connection cities" and since interline business is about a third of our total, you can bet this is important to us.

We'll go all out to take care of your passengers in the hospitable Delta tradition. We'll also do our best to maintain the "balance of trade" with a fair exchange in return. Interline business is a two-way street and we want to make it mutually profitable.

Drop in and see us whenever you're in Atlanta. George Shedd is our Interline Sales Manager.

GENERAL OFFICES: ATLANTA, GEORGIA

One of America's Pioneer Scheduled Airlines

Delta AIR LINES

LEADERSHIP: automatic

Aer Lingus . . . another airline

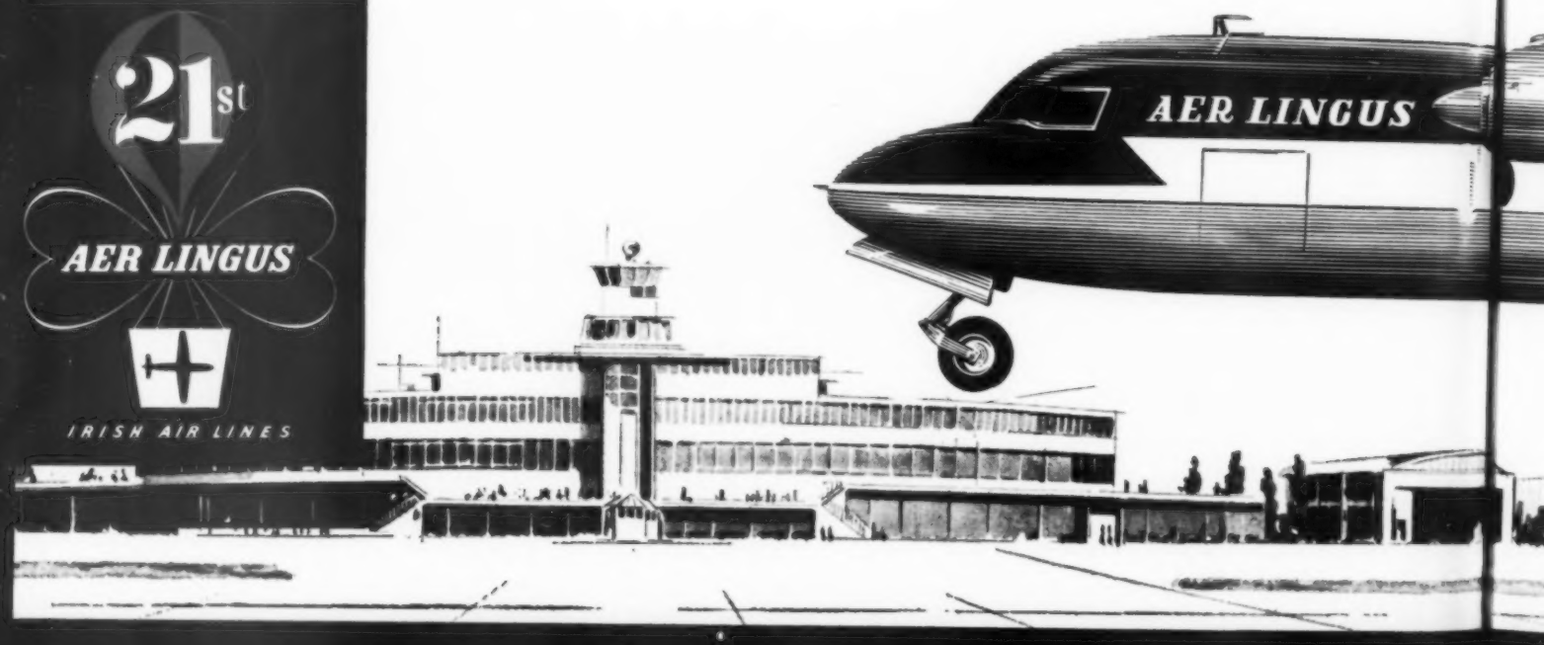
Collins Automatic Pilot controls the aircraft in all modes of flight with unequalled smoothness. Its advanced features improve steering interpretation, dependability, and control. As an integral part of the Automatic Pilot, Collins Integrated Flight System presents the pilot with a continuous picture of flight attitude and navigational situation.

The new Aer Lingus fleet of Fokker F-27 "Friendships" is being equipped with Collins Automatic Pilot; Integrated Flight System; ADF, VHF, VOR/ILS and Marker Beacon Receivers; HF Transceiver, and Compass System. Collins equipment is also on order for Aer Lingus Vickers Viscount 800's.

21st

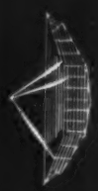
AER LINGUS

IRISH AIR LINES



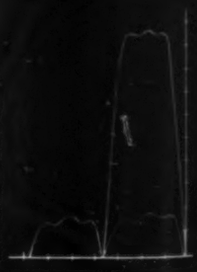
COLLINS IN GROUND COMMUNICATION

Collins engineers, designs and supplies the equipment, installs, and puts into operation integrated point-to-point communication systems of any scope. The Collins system engineering staff is backed by the finest equipment in the world, whether standard MF, HF or VHF, Transhorizon "scatter," microwave relay and multiplex or single sideband HF. Typical of Collins communication progress is "Kineplex" — a high speed data transmission system doubling communication capacity.



COLLINS IN AMATEUR RADIO

In the early 1930's Collins set the standard in Amateur radio and, through continuous design and development, has raised this standard to its present single sideband station — the most honored and prized in the Amateur fraternity. This station is the top performing rig on the air with its kilowatt KWS-1 transmitter and highly selective 75A-4 receiver. Many of the leaders in the electronics industry became acquainted with Collins through the Company's superior Amateur equipment.

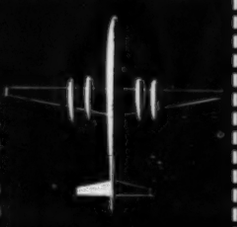


Collins CREATIVE LEADER IN AVIATION ELECTRONICS

flight control

selects the world's finest control system

COLLINS IN AVIATION



Collins completely outfits airline, military and business aircraft with the most advanced communication, navigation, flight control and instrumentation systems in aviation. Many new lightweight, reduced-size versions are now being delivered. Collins designed the original Integrated Flight System, leads in combining comm/nav/ident units into a single compact "CNI" package for new military aircraft, and continues to pace the industry in developments in airborne radar, ADF, ILS, VOR, HF and VHF communication.

COLLINS IN COMPONENTS AND TEST EQUIPMENT

The degree of precision and reliability of Collins products requires development by Collins engineering of components such as Autotunes and Autopositioners, Mechanical Filters, oscillators, heat reducing tube shields and ferrites. These developments and other high quality components are sold by a Collins subsidiary, Communication Accessories Company of Hickman Mills, Missouri. The same principles of accuracy and reliability apply to Collins test equipment, built especially for Collins but adaptable to testing other equipment types.

COLLINS

COLLINS RADIO COMPANY, CEDAR RAPIDS, IOWA • DALLAS • BURBANK • NEW YORK • WASHINGTON, D.C.
MIAMI • SEATTLE • COLLINS RADIO COMPANY OF CANADA, LTD., TORONTO • COLLINS RADIO COMPANY
OF ENGLAND, LTD., LONDON • COLLINS RADIO INTERNATIONAL C.A., PARIS • TOKYO

CONVAIR 880: World's Fastest Jet Passenger Plane!

Racing with the sun at 615 miles an hour, Convair's 880 Jet-Liner will cut your travel time in half! The only jet transport designed to operate from hundreds of existing airports, it will bring silent, vibrationless flight to travelers everywhere . . . big cities and small.

Convair's 880 Jet-Liner, powered by General Electric CJ-805 engines, will be delivered to leading airlines* for world-wide service beginning in 1959. In this new era of jet transportation, Convair's luxurious 880 Jet-Liner will be the world's fastest passenger plane—truly master of the skies!

CONVAIR

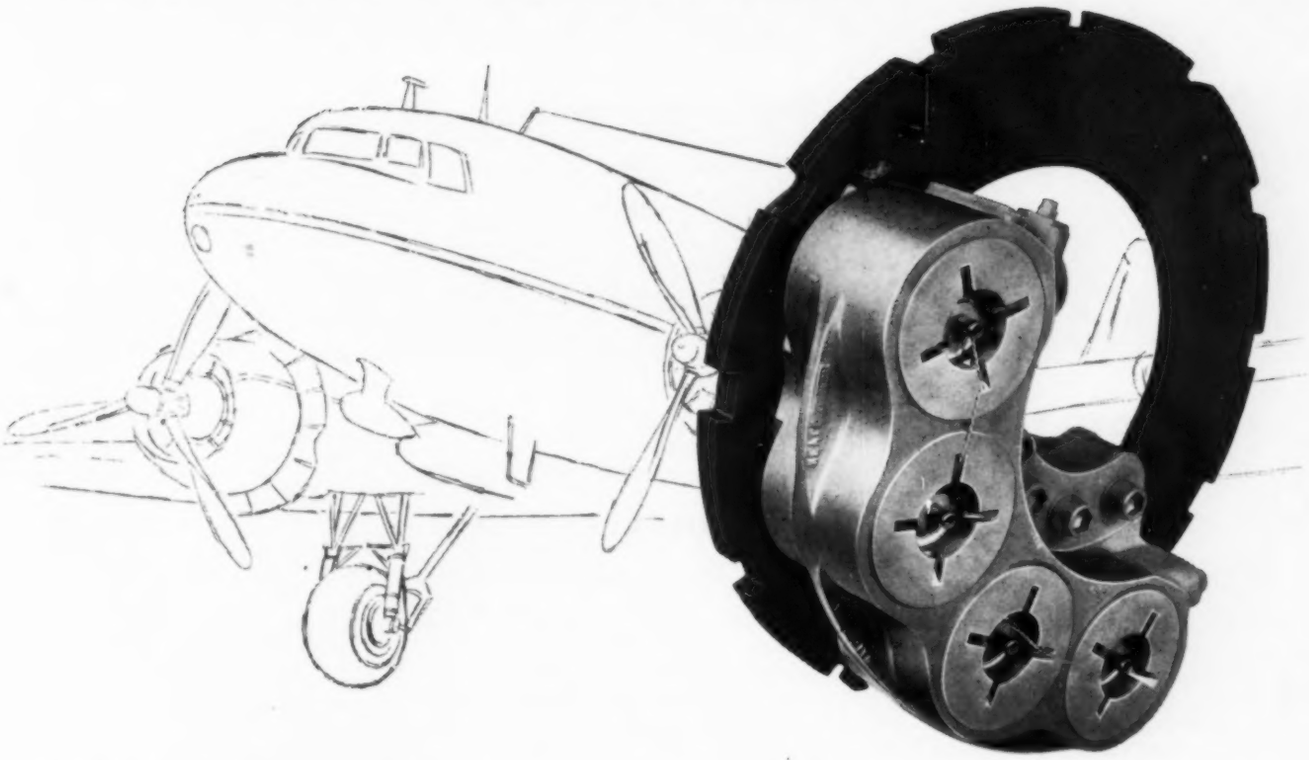
A DIVISION OF GENERAL DYNAMICS CORPORATION

*AMONG AIRLINES TO FIRST OFFER CONVAIR 880 JET-LINER SERVICE WILL BE TWA • Delta • TRANSCONTINENTAL S.A. (Argentina)

DC-3's converted to Goodyear Single Disc Brakes give

PROVED

Safety – Economy – Trouble-free Service



Countless DC-3's have undergone an important change: change-over from original braking systems to Goodyear Single Disc Brakes—the disc-type braking principle that is No. 1 in preference on the nation's aircraft today.

When using this modern brake, DC-3 owners realize impressive economies and greatly increased safety and efficiency.

Witness these facts:

(1) Maintenance and overhaul labor can be reduced approximately 75% by such conversion. One airline effected a five-year saving of $84,983.22 by converting 29 of its DC-3's to Goodyear brakes.

(2) A weight-saving of approximately 65 lbs. per aircraft can be achieved by the Goodyear change-over.

(3) From the standpoint of safety, economy, trouble-free performance, and simplicity of maintenance—the Goodyear 17.00-16 Single Disc Brake and Wheel Assembly is the best equipment that can be installed on the DC-3 aircraft.

When used with Douglas Super DC-3 axle, the airplane can be qualified for maximum gross loads.

Complete information can be had by any interested DC-3 owner or operator by writing Goodyear, Aviation Products Division, Dept. F-1717, Akron 16, Ohio, or Los Angeles 54, California.

GOODYEAR
AVIATION
PRODUCTS

AIRCRAFT COSTING MILLIONS...

G PHOTO

...ARE PROTECTED BY THE B&H

JETCAL® ANALYZER

Two of the most important factors that affect jet engine life, efficiency, and safe operation are *Exhaust Gas Temperature (EGT)* and *Engine Speed (RPM)*. Excess heat will reduce "bucket" life as much as 50% and low EGT materially reduces efficiency and thrust. Any of such conditions will make operation of the aircraft both costly and dangerous. The *JETCAL Analyzer* predetermines accuracy of the EGT and (interrelatedly) Tachometer systems and isolates errors if they exist.

The *JETCAL* ANALYZES JET ENGINES 10 WAYS:

1) The JETCAL Analyzer *functionally* tests EGT thermocouple circuit of a jet aircraft or pilotless aircraft missile for error *without running the engine or disconnecting any wiring*. GUARANTEED ACCURACY is ±4°C. at engine test temperature.

2) Checks individual thermocouples "on the bench" before placement in parallel harness.

3) Checks thermocouples within the harness for continuity.

4) Checks thermocouples *and* paralleling harness for accuracy.

5) Checks resistance of the Exhaust Gas Temperature system.

6) Checks insulation of the EGT circuit for shorts to ground and for shorts between leads.

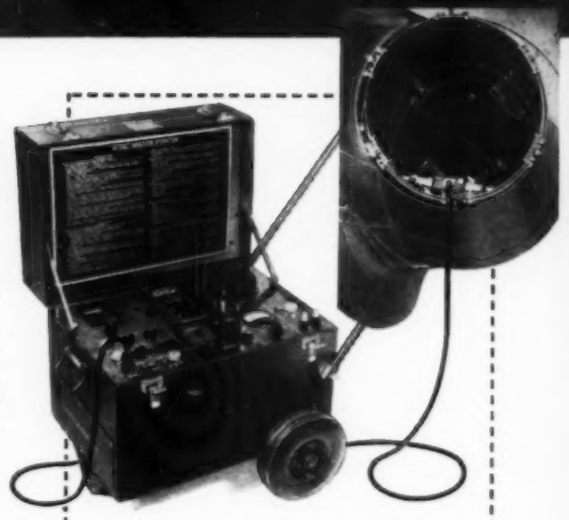
7) Checks EGT Indicators (in or out of the aircraft).

8) Checks EGT system with engine removed from aircraft (in production line or overhaul shop).

9) Reads jet engine speed while the engine is running with a guaranteed accuracy of ±0.1% in the range of 0-110% RPM. Additionally, the TAKCAL circuit can be used to trouble shoot and isolate errors in the aircraft tachometer system.

10) JETCAL Analyzer enables engine adjustment to proper relationship between engine temperature and engine RPM for maximum thrust and efficiency during engine run (Tabbing or Micing).

ALSO *functionally* checks aircraft Over-Heat Detectors and Wing Anti-Ice Systems (thermal switch and continuous wire) by using TEMPCAL Probes.. Rapid heat rise . . . 3 minutes to 800°F! Fast cycling time of thermal switches . . . 4 to 5 complete cycles per minute for bench checking in production.



Tests EGT System Accuracy to ±4°C at Test Temperature

(functionally, without running the engine)

Tests RPM Accuracy to 10 RPM in 10,000 RPM (±0.1%)

The JETCAL is in worldwide use . . . by the U. S. Navy and Air Force as well as by major aircraft and engine manufacturers. Write, wire or phone for complete information.

B & H INSTRUMENT CO., INC.

3479 West Vickery Blvd. • Fort Worth 7, Texas

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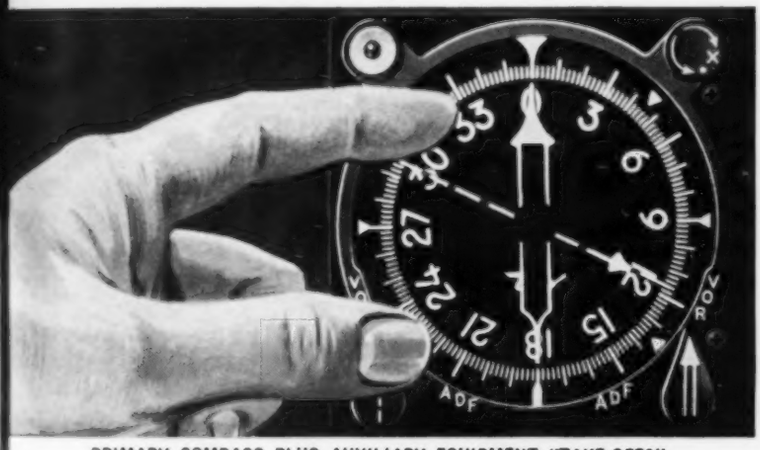
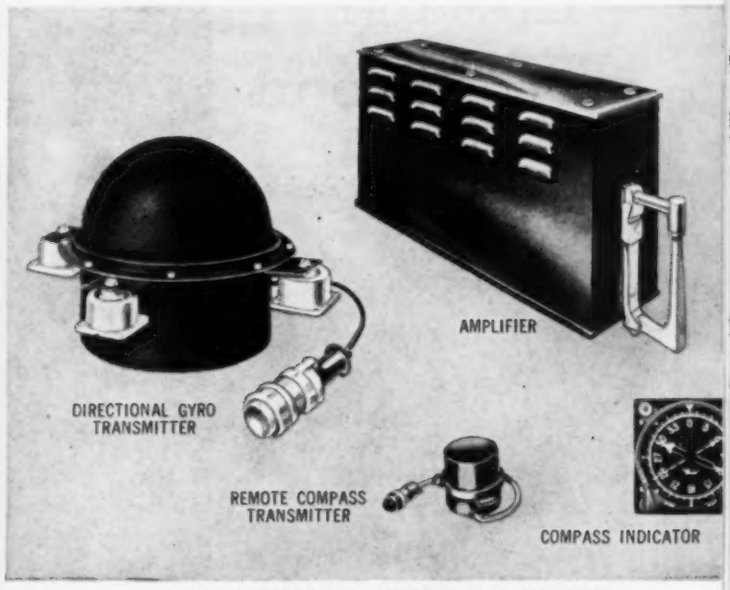
DESIGNED FOR WIDE RANGE OF AIRCRAFT

INTEGRAL VOR AND ADF SWITCHING



PRIMARY COMPASS PLUS AUXILIARY EQUIPMENT "TAKE-OFFS"



NEW SYSTEM SMALL, COMPACT, YET COMPLETE

NEW, LIGHTWEIGHT BENDIX CONTINENTAL COMPASS SYSTEM OFFERS BIG SYSTEM ADVANTAGES AT MODERATE COST

Here, for transport, executive, and private aircraft, are all the stability and accuracy of famed Polar Path* plus the lower cost and simplified design of a compass system for use in non-polar areas.

The new Bendix Continental Compass System offers many advantages never before available at such a modest price. For example:

- *Both magnetic accuracy and gyro stability.* This results from slaving 1° random-drift, directional gyro transmitter to a magnetic-sensing, remote compass transmitter.
- *RMI and primary compass combined.* A single indicator provides the functions of a conventional RMI and a master direction indicator, as well as "take-offs" for operating repeaters, an autopilot, or other navigational equipment.
- *Integral VOR-ADF switching.* Pointers may be switched to VOR or ADF by individual, self-contained selectors instead of the usual remote switching arrangement.
- *Transistorized, modularly constructed amplifier.* The use of transistors and same "card-type" advanced packaging technique as the Bendix PB-20 Automatic Flight Control System affords greater operating dependability and simplified maintenance.

In these, and many other ways this Continental version of Bendix Polar Path conforms to every modern navigational requirement. Get full particulars. ECLIPSE-PIONEER DIVISION, BENDIX AVIATION CORPORATION, TETERBORO, NEW JERSEY.

*REGISTERED TRADEMARK BENDIX AVIATION CORPORATION

District Offices: Burbank, Calif., Dayton, Ohio, and Seattle, Wash.
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Eclipse-Pioneer Division

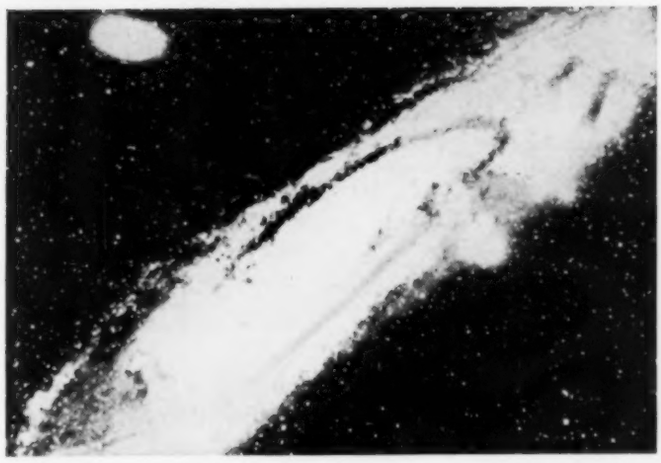
Bendix
AVIATION CORPORATION

The first men on the moon

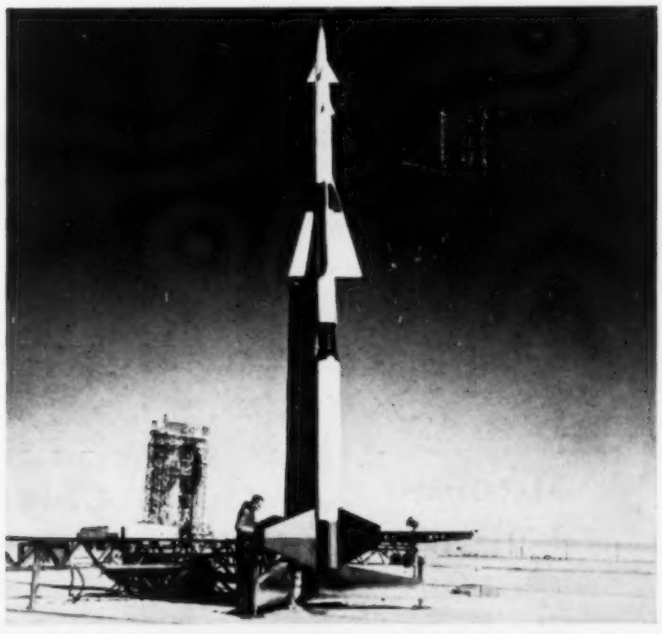
What Douglas engineers are doing to make it possible!

Space travel, a dream five years ago, is now so near reality that lunar landings are predicted by the end of this century.

This is hastened by knowledge being gained in *present* and *practical* research. For instance, when Douglas engineers find new ways for fliers to survive high gravitational pulls at supersonic speeds, they also help some future pilot survive the blast-off of a moon-bound rocket. And current studies on heat dispersion, aimed at getting an intercontinental missile back into our atmosphere without air friction burning it up, will apply to the problem of returning a space ship safely to earth.



With the possibility of interplanetary flight accepted by engineers, man now looks to outer space and is speculating on new power sources needed to get him there. A predicted break-through is the plasma engine, which will harness ions or light itself to drive aircraft nearly 186,000 miles per second.



At Douglas, a Missiles Division with the longest history in its field, is building rockets and missiles for military use. Nike Ajax (above) is already guarding principal cities, and soon the more potent Nike Hercules will be ready to take over these assignments. Thor, an intermediate range ballistics missile, is undergoing tests, and on the classified list are many other out-of-this-world projects in engineering, design and construction.

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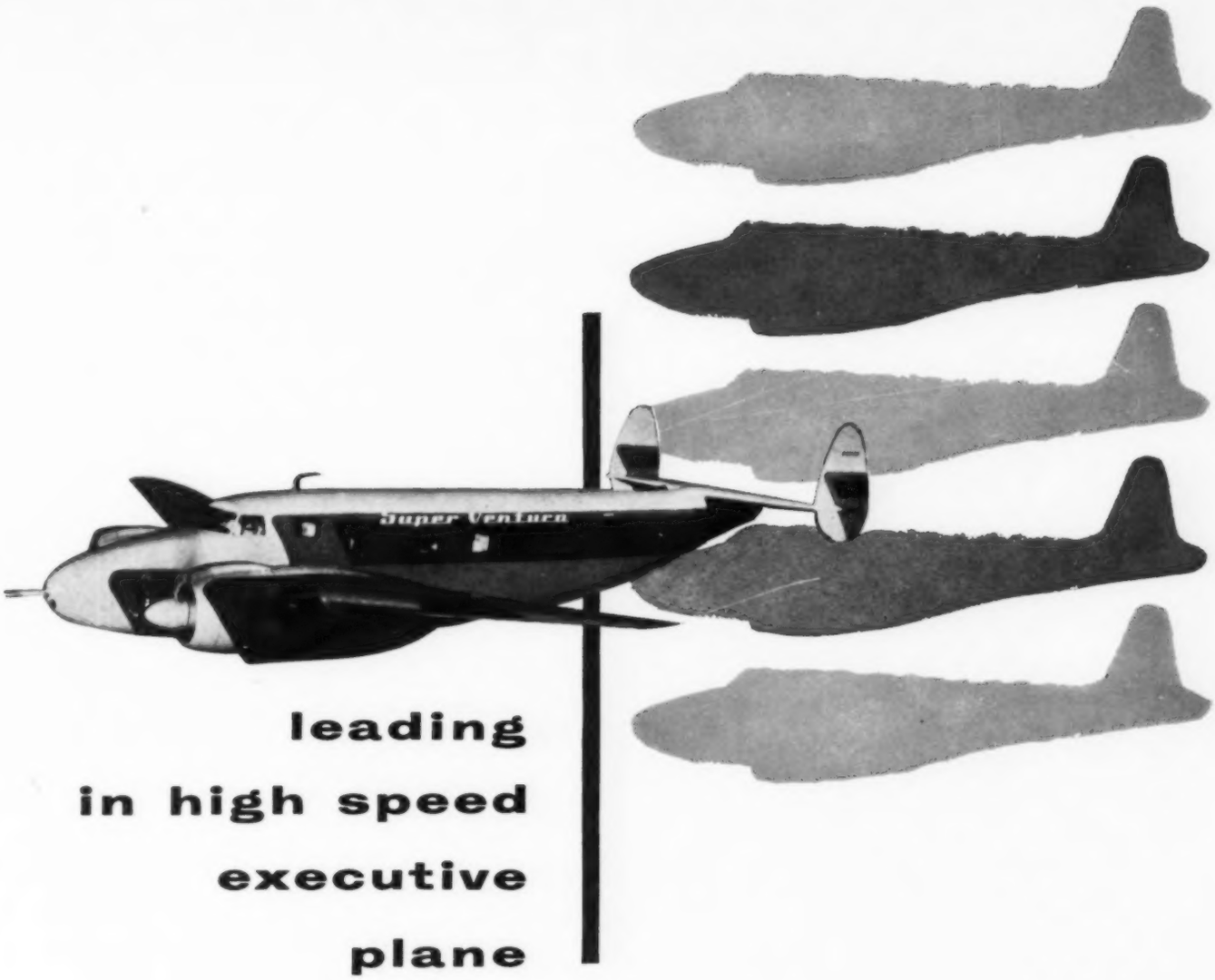

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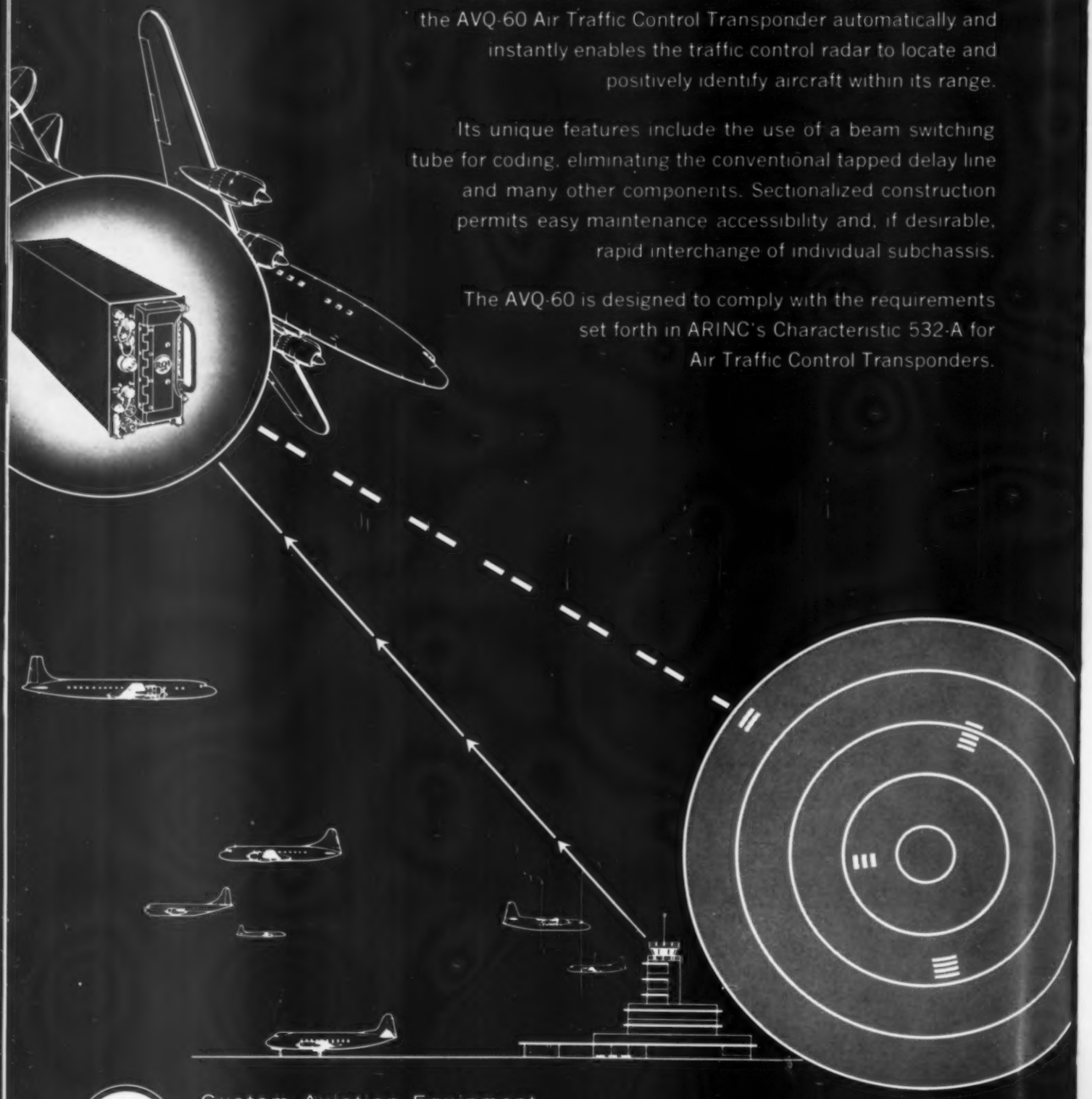
The AVQ-60 is designed to comply with the requirements set forth in ARINC's Characteristic 532-A for Air Traffic Control Transponders.



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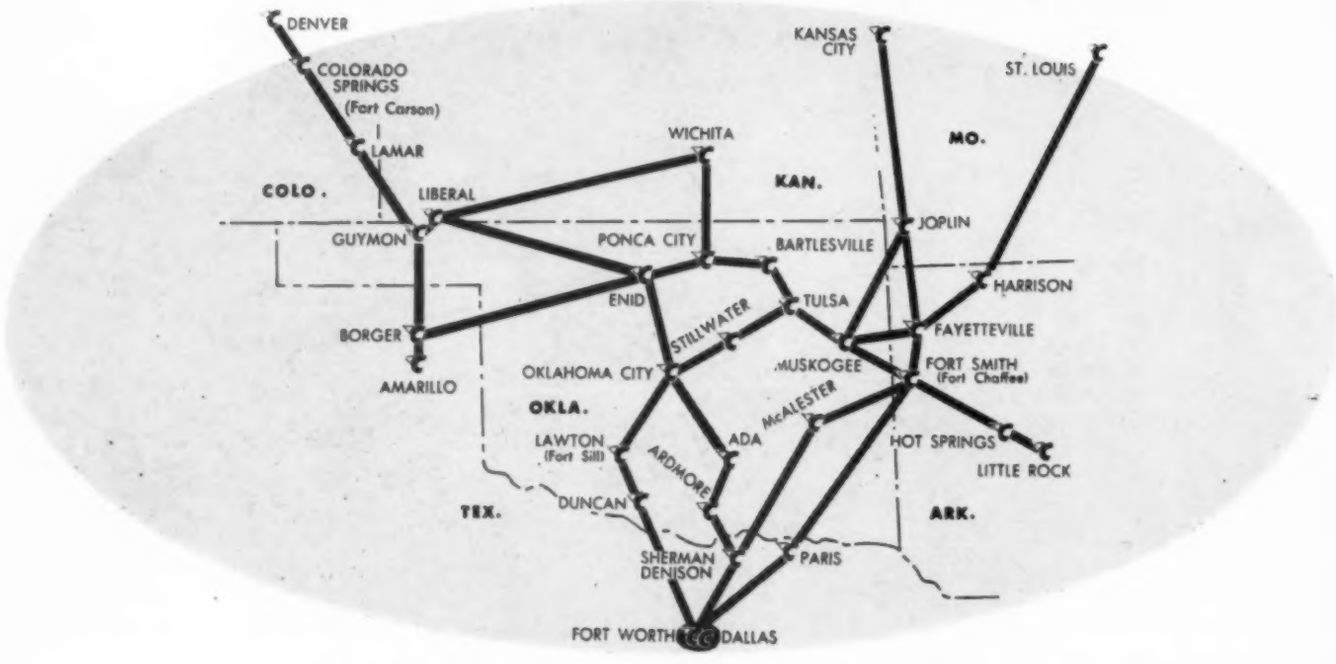

Yes, Central Airlines provides the great Southwest and Midwest with air service to 33 cities in Texas, Arkansas, Colorado, Kansas, Missouri and Oklahoma with *exclusive* service to 17 cities. Along Central's routes are 51 major military bases. Connections to the Heart of America are through 11 major gateways.

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SELECTED REVENUES AND EXPENSES (Dollars)	Allegheny	Bonanza	Central	Frontier	Lake Central
Passenger Revenue	4,309,878	1,662,499	1,167,558	3,162,235	1,315,970
Total Non-Mail Revenue	4,584,573	1,825,197	1,262,897	3,556,348	1,441,547
Mail Pay	2,011,061	1,345,287	2,119,193	2,592,244	1,343,416
Total Revenue	6,595,634	3,170,484	3,382,090	6,148,592	2,784,963
Direct Expense	3,234,225	1,341,666	1,460,749	2,630,567	1,165,390
Ground and Indirect Expense	3,658,474	1,623,740	1,920,851	3,295,291	1,615,431
Total Expense	6,892,699	2,965,406	3,381,600	5,925,858	2,780,821
Profit (or Loss)	(297,065)	205,078	490	222,734	4,142
SELECTED OPERATING STATISTICS					
Revenue Miles	5,460,875	2,870,214	2,785,679	5,421,167	2,365,966
Revenue Passengers	393,668	127,860	107,758	197,902	136,956
Revenue Passenger Miles (000)	64,941	27,641	19,760	53,300	21,368
Passenger Load Factor (%)	49.97	45.86	33.78	46.82	43.02
Revenue Ton-Miles	6,569,553	2,910,702	2,033,980	6,431,653	2,130,759
Ton-Mile Utilization Factor (%)	45.36	42.25	30.42	49.43	37.52
REVENUES AND EXPENSES—Cents Per Revenue Mile					
Revenues:					
Passenger	78.92	57.92	41.91	58.33	55.62
Total Non-Mail	83.95	63.59	45.34	65.60	60.93
Mail Pay	36.83	46.87	76.07	47.82	56.78
Total Revenue	120.78	110.46	121.41	113.42	117.71
Expenses:					
Flying Operations	40.08	32.15	36.44	36.78	35.46
Maintenance Flight Equipment	15.59	11.28	12.87	10.42	12.54
Depreciation Flight Equipment	4.56	3.31	3.13	1.32	1.25
Total Direct Expense	59.23	46.74	52.44	48.52	49.25
Ground Operations	19.59	16.21	35.00	18.80	20.84
Maintenance—Ground and Indirect	7.69	7.49	8.86	8.40	8.90
Passenger Service	6.45	4.88	5.45	5.95	5.32
Traffic and Sales	20.11	13.54	6.79	13.90	20.14
Advertising and Publicity	3.65	3.36	1.91	4.18	1.41
General and Administrative	8.55	9.80	10.05	8.55	10.76
Depreciation Ground Equipment	0.95	1.29	0.89	1.01	0.91
Total Ground and Indirect Expense	66.99	56.57	68.95	60.79	68.28
Total Expense	126.22	103.31	121.39	109.31	117.53
Profit (or Loss)	(5.44)	7.15	0.02	4.11	0.18
Break-Even Need	42.27	39.72	76.05	43.71	56.60
SELECTED REVENUES AND EXPENSES—Cents Per Ton-Mile					
Total Non-Mail Revenue	69.79	62.71	62.09	55.29	67.65
Total Revenue	100.40	108.93	166.28	95.60	130.70
Total Expense	104.92	101.88	166.26	92.14	130.51
Break-Even Need	35.13	39.17	104.17	36.85	62.86
ADDITIONAL OPERATING STATISTICS					
Scheduled Miles	5,744,249	2,777,992	2,868,717	5,301,975	2,458,066
Completion Factor (%)	93.42	99.38	96.14	99.06	94.58
Average Passenger Load	11.89	9.63	7.09	9.83	9.03
Average Length of Journey	165	216	183	269	156
Revenue Ton-Miles:					
Passenger	6,169,491	2,740,142	1,877,488	5,314,898	1,946,170
U. S. Mail	86,867	49,162	46,835	343,405	26,594
Express and Freight	287,199	106,909	97,414	741,901	148,012
Excess Baggage	25,996	14,489	12,243	31,449	9,983
Average Ton Load	1.20	1.01	0.73	1.19	0.90
Ton-Miles of Surface Mail	9,208	17,431	6,863	94,012	1,899
Total Revenue Hours	38,110	19,247	19,215	36,124	16,875
Average Flying Speed (MPH)	143.3	149.1	145.0	150.1	140.2
Type(s) of Aircraft Operated	202/DC-3	DC-3	DC-3	DC-3	DC-3
Number of Aircraft Operated	20	9	11	13	10
Daily Aircraft Utilization	5:27	6:15	5:37	7:32	5:26
Daily Route Mile Turnover	9.4	5.7	4.3	4.6	5.5
Landings Per Day	190	71	97	156	96
Tons of U. S. Mail Carried	594	225	246	709	202
Tons of Express and Freight Carried	1,954	609	531	2,224	1,131
Gallons of Fuel Consumed (000)	4,712.4	2,028.0	2,166.7	3,981.6	1,792.5
Number of Employes	686	315	406	680	353
Number of Actual Departures	69,372	25,775	35,348	57,006	35,047
Number of Months in Operation	93	84	87	121	86
Per Actual Departure:					
Revenue Miles	78.7	111.4	78.8	95.1	67.5
Revenue Passengers	5.7	5.0	3.0	3.5	3.9
Revenue Passenger Miles	936	1,072	559	935	610
Per Employe:					
Revenue Miles	7,960	9,112	6,861	7,972	6,702
Revenue Passengers	574	406	265	291	388
Revenue Passenger Miles	94,666	87,749	48,670	78,382	60,533
ADDITIONAL FINANCIAL DATA					
Ratio-Total Expense to Non-Mail Revenue	1.50	1.62	2.68	1.67	1.93
Non-Mail Revenue Per:					
Revenue Passenger (Dollars)	11.65	14.27	11.72	17.97	10.53
Revenue Passenger Miles (Cents)	7.06	6.60	6.39	6.67	6.75
Actual Departure (Dollars)	66.09	70.81	35.73	62.39	41.13
Employe (Dollars)	6,683	5,794	3,111	5,230	4,084

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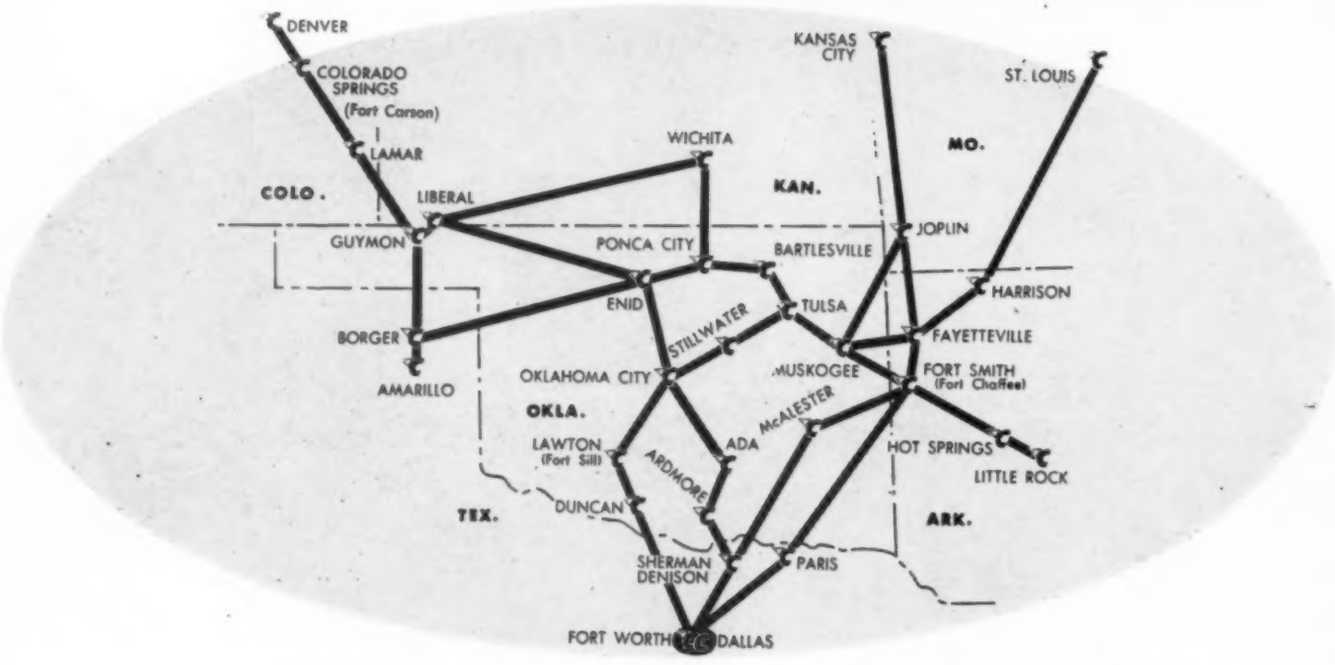
SERVICE TO 33 CITIES IN 6 STATES

51 Major Military Installations



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Statistical Analysis of Local Service Air

SELECTED REVENUES AND EXPENSES (Dollars)	Allegheny	Bonanza	Central	Frontier	Lake Central	Moha
Passenger Revenue	4,309,878	1,662,499	1,167,558	3,162,235	1,315,970	4,377,
Total Non-Mail Revenue	4,584,573	1,825,197	1,262,897	3,556,348	1,441,547	4,779,
Mail Pay	2,011,061	1,345,287	2,119,193	2,592,244	1,343,416	756,
Total Revenue	6,595,634	3,170,484	3,382,090	6,148,592	2,784,963	5,535,
Direct Expense	3,234,225	1,341,666	1,460,749	2,630,567	1,165,390	3,064,
Ground and Indirect Expense	3,658,474	1,623,740	1,920,851	3,295,291	1,615,431	2,972,
Total Expense	6,892,699	2,965,406	3,381,600	5,925,858	2,780,821	6,037,
Profit (or Loss)	(297,065)	205,078	490	222,734	4,142	
SELECTED OPERATING STATISTICS						
Revenue Miles	5,460,875	2,870,214	2,785,679	5,421,167	2,365,966	(501, 4,178,
Revenue Passengers	393,668	127,860	107,758	197,902	136,956	360,
Revenue Passenger Miles (000)	64,941	27,641	19,760	53,300	21,368	64,
Passenger Load Factor (%)	49.97	45.86	33.78	46.82	43.02	59
Revenue Ton-Miles	6,569,553	2,910,702	2,033,980	6,431,653	2,130,759	6,469,
Ton-Mile Utilization Factor (%)	45.36	42.25	30.42	49.43	37.52	54
REVENUES AND EXPENSES—Cents Per Revenue Mile						
Revenues:						
Passenger	78.92	57.92	41.91	58.33	55.62	104
Total Non-Mail	83.95	63.59	45.34	65.60	60.93	114
Mail Pay	36.83	46.87	76.07	47.82	56.78	18
Total Revenue	120.78	110.46	121.41	113.42	117.71	132
Expenses:						
Flying Operations	40.08	32.15	36.44	36.78	35.46	44
Maintenance Flight Equipment	15.59	11.28	12.87	10.42	12.54	21
Depreciation Flight Equipment	4.56	3.31	3.13	1.32	1.25	7
Total Direct Expense	59.23	46.74	52.44	48.52	49.25	73
Ground Operations	19.59	16.21	35.00	18.80	20.84	20
Maintenance—Ground and Indirect	7.69	7.49	8.86	8.40	8.90	9
Passenger Service	6.45	4.88	5.45	5.95	5.32	6
Traffic and Sales	20.11	13.54	6.79	13.90	20.14	18
Advertising and Publicity	3.65	3.36	1.91	4.18	1.41	2
General and Administrative	8.55	9.80	10.05	8.55	10.76	12
Depreciation Ground Equipment	0.95	1.29	0.89	1.01	0.91	1
Total Ground and Indirect Expense	66.99	56.57	68.95	60.79	68.28	71
Total Expense	126.22	103.31	121.39	109.31	117.53	144
Profit (or Loss)	(5.44)	7.15	0.02	4.11	0.18	(12
Break-Even Need	42.27	39.72	76.05	43.71	56.60	30
SELECTED REVENUES AND EXPENSES—Cents Per Ton-Mile						
Total Non-Mail Revenue	69.79	62.71	62.09	55.29	67.65	73
Total Revenue	100.40	108.93	166.28	95.60	130.70	85
Total Expense	104.92	101.88	166.26	92.14	130.51	93
Break-Even Need	35.13	39.17	104.17	36.85	62.86	19
ADDITIONAL OPERATING STATISTICS						
Scheduled Miles	5,744,249	2,777,992	2,868,717	5,301,975	2,458,066	4,104,
Completion Factor (%)	93.42	99.38	96.14	99.06	94.58	94
Average Passenger Load	11.89	9.63	7.09	9.83	9.03	15
Average Length of Journey	165	216	183	269	156	
Revenue Ton-Miles:						
Passenger	6,169,491	2,740,142	1,877,488	5,314,898	1,946,170	6,147,
U. S. Mail	86,867	49,162	46,835	343,405	26,594	63,
Express and Freight	287,199	106,909	97,414	741,901	148,012	233,
Excess Baggage	25,996	14,489	12,243	31,449	9,983	25,
Average Ton Load	1.20	1.01	0.73	1.19	0.90	1
Ton-Miles of Surface Mail	9,208	17,431	6,863	94,012	1,899	6,
Total Revenue Hours	38,110	19,247	19,215	36,124	16,875	28,
Average Flying Speed (MPH)	143.3	149.1	145.0	150.1	140.2	14
Type(s) of Aircraft Operated	202/DC-3	DC-3	DC-3	DC-3	DC-3	240/D
Number of Aircraft Operated	20	9	11	13	10	
Daily Aircraft Utilization	5:27	6:15	5:37	7:32	5:26	6
Daily Route Mile Turnover	9.4	5.7	4.3	4.6	5.5	1
Landings Per Day	190	71	97	156	96	
Tons of U. S. Mail Carried	594	225	246	709	202	
Tons of Express and Freight Carried	1,954	609	531	2,224	1,131	1,
Gallons of Fuel Consumed (000)	4,712.4	2,028.0	2,166.7	3,981.6	1,792.5	3,84
Number of Employes	686	315	406	680	353	
Number of Actual Departures	69,372	25,775	35,348	57,006	35,047	50,
Number of Months in Operation	93	84	87	121	86	
Per Actual Departure:						
Revenue Miles	78.7	111.4	78.8	95.1	67.5	8
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Per Employe:						
Revenue Miles	7,960	9,112	6,861	7,972	6,702	6,
Revenue Passengers	574	406	265	291	388	
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Non-Mail Revenue Per:						
Revenue Passenger (Dollars)	11.65	14.27	11.72	17.97	10.53	13.
Revenue Passenger Miles (Cents)	7.06	6.60	6.39	6.67	6.75	7.
Actual Departure (Dollars)	66.09	70.81	35.73	62.39	41.13	94.
Employe (Dollars)	6,683	5,794	3,111	5,230	4,084	7,9

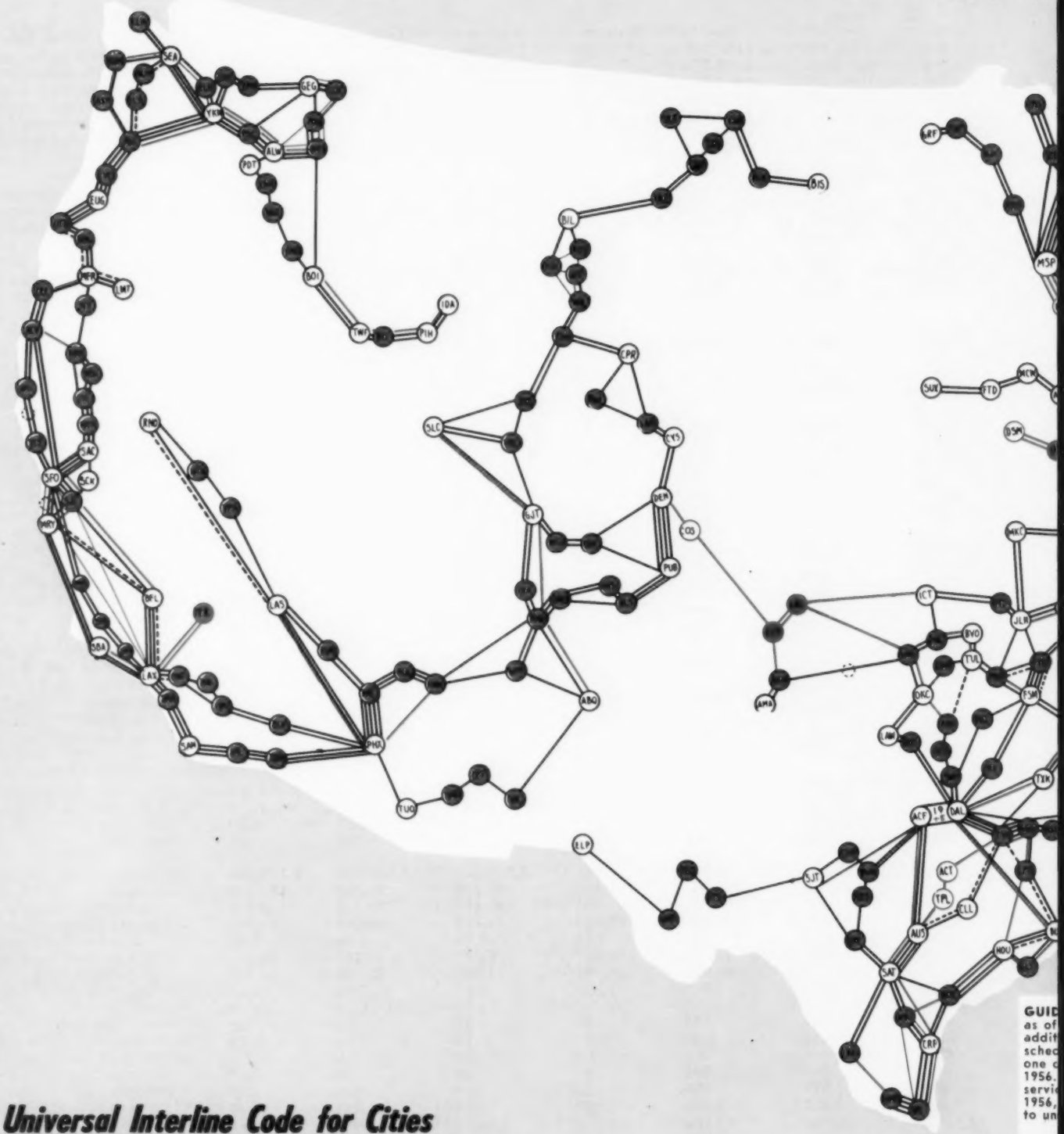
rvice Airline Operations for 1956

Mohawk	North Central	Ozark	Piedmont	Southern	Southwest	Trans-Texas	West Coast	Total or Average
4,377,600	6,124,180	3,080,396	4,780,179	1,945,889	3,129,855	2,990,254	2,119,465	40,165,958
4,779,396	6,453,265	3,275,755	5,168,392	2,135,451	3,471,228	3,224,869	2,214,055	43,392,973
756,391	1,487,811	2,497,612	2,286,716	1,813,127	1,525,938	2,758,362	1,780,879	24,318,037
5,535,787	7,941,076	5,773,367	7,455,108	3,948,578	4,997,166	5,983,231	3,994,934	67,716,010
3,064,646	3,745,845	2,783,829	3,539,194	1,704,532	2,695,225	2,853,413	1,770,821	31,990,102
2,972,387	4,159,515	3,097,341	4,088,658	2,275,494	2,459,026	3,092,944	2,090,015	36,349,167
6,037,033	7,905,360	5,881,170	7,627,852	3,980,026	5,154,251	5,946,357	3,860,836	68,339,269
(501,246)	35,716	(107,803)	(172,744)	(31,448)	(157,085)	36,874	134,098	(628,259)
4,178,448	7,900,015	5,225,986	6,952,278	3,616,354	4,048,797	6,056,996	3,646,541	60,529,316
360,369	551,775	318,994	405,153	191,080	289,240	220,613	214,874	3,516,242
64,708	85,659	49,013	77,136	33,752	59,398	50,184	38,134	644,994
59.99	51.63	44.66	52.83	44.44	52.61	39.45	49.85	48.34
6,469,684	8,775,078	4,980,197	7,854,801	3,488,081	5,909,876	5,293,370	3,626,285	66,474,019
54.65	46.28	39.71	47.08	40.19	48.34	36.41	41.48	44.04
104.77	77.52	58.94	68.76	53.81	77.30	49.37	58.12	66.36
114.38	81.69	62.68	74.34	59.05	85.73	53.24	60.72	71.69
18.10	18.83	47.79	32.89	50.14	37.69	45.54	48.84	40.18
132.48	100.52	110.47	107.23	109.19	123.42	98.78	109.56	111.87
44.07	31.92	33.64	35.31	33.11	39.11	32.19	36.99	35.71
21.72	12.73	14.87	13.19	10.80	20.92	12.19	9.90	13.69
7.55	2.77	4.76	2.41	3.22	6.54	2.73	1.67	3.45
73.34	47.42	53.27	50.91	47.13	66.57	47.11	48.56	52.85
20.15	17.05	16.40	14.19	16.72	18.60	17.36	19.84	18.48
9.23	3.52	7.04	7.25	8.74	7.64	6.87	6.73	7.22
6.57	5.53	5.53	5.87	5.91	5.21	4.58	5.02	5.60
18.55	15.98	16.53	18.62	18.68	13.49	12.26	11.46	15.67
2.49	2.74	2.43	3.74	2.81	4.80	3.31	2.81	3.16
12.67	6.79	9.77	8.40	9.12	9.88	6.04	10.39	8.89
1.48	1.04	1.57	0.74	0.94	1.11	0.64	1.06	1.03
71.14	52.65	59.27	58.51	62.92	60.73	51.06	57.31	60.05
144.48	100.07	112.54	109.72	110.05	127.30	98.17	105.87	112.90
(12.00)	0.45	(2.07)	(2.49)	(0.86)	(3.88)	0.61	3.69	(1.03)
30.10	18.38	49.86	35.38	51.00	41.57	44.93	45.15	41.21
73.87	73.54	65.78	65.80	61.22	58.74	60.92	61.06	65.28
85.57	90.50	115.93	94.91	113.20	84.56	113.03	110.17	101.86
93.31	90.09	118.09	97.11	114.10	87.21	112.34	106.47	102.81
19.44	16.55	52.31	31.31	52.88	28.47	51.42	45.41	37.53
4,104,085	8,154,817	5,448,143	6,988,282	3,556,944	3,819,012	6,130,167	3,719,729	61,072,178
94.90	95.09	95.02	98.75	98.26	98.23	97.79	96.83	96.66
15.49	10.84	9.38	11.10	9.33	14.67	8.29	10.46	10.66
180	155	154	190	177	205	227	177	183
6,147,785	8,140,151	4,558,082	7,327,965	3,206,349	5,642,729	4,767,394	3,472,855	61,311,449
63,197	226,220	115,452	172,230	101,542	95,993	161,719	47,240	1,536,456
233,175	361,346	281,093	297,961	155,411	158,492	346,149	90,779	3,305,841
25,527	47,361	25,570	56,645	24,779	12,662	18,108	15,411	320,223
1.55	1.11	0.95	1.13	0.96	1.46	0.87	1.00	1.10
6,716	62,981	15,842	68,297	8,597	11,309	30,707	10,105	343,967
28,401	55,651	36,337	48,144	24,328	25,803	39,204	27,118	414,557
147.1	142.0	143.8	144.4	148.6	156.9	154.5	134.5	146.0
240/DC-3	DC-3	DC-3	DC-3	DC-3	202/DC-3	DC-3	DC-3	
13	21	19	20	13	13	18	14	194
6:27	7:39	6:01	7:21	5:20	5:36	6:18	5:33	6:18
12.3	9.6	5.8	9.8	5.2	8.4	5.5	6.0	7.1
138	283	180	238	134	135	212	148	2,078
382	1,376	636	742	584	676	619	321	7,312
1,521	2,462	1,989	1,455	803	1,020	1,506	515	17,720
3,846.6	5,603.7	4,141.6	5,101.5	2,551.7	3,798.3	4,680.0	2,817.7	47,222.3
604	977	693	843	482	417	680	428	7,564
50,533	103,184	65,836	86,798	48,824	49,240	77,259	53,883	758,105
99	106	75	106	91	120	111	120	103
82.7	76.6	79.4	80.1	74.1	82.2	78.4	67.7	79.8
7.1	5.3	4.8	4.7	3.9	5.9	2.9	4.0	4.6
1,281	830	744	889	691	1,206	650	708	851
6,918	8,086	7,541	8,247	7,503	9,709	8,907	8,520	8,002
597	565	460	481	396	694	324	502	465
107,132	87,676	70,726	91,502	70,025	142,441	73,800	89,098	85,272
1.26	1.23	1.80	1.48	1.86	1.48	1.84	1.74	1.57
13.26	11.70	10.27	12.76	11.18	12.00	14.62	10.30	12.34
7.39	7.53	6.68	6.70	6.33	5.84	6.43	5.81	6.73
94.58	62.54	49.76	59.55	43.74	70.50	41.74	41.09	57.24
7,913	6,605	4,727	6,131	4,430	8,324	4,742	5,173	5,737

—(FLIGHT MAGAZINE Compilation by Ray & Ray, Consultants)

Local Service Airline Route

MAY, 195



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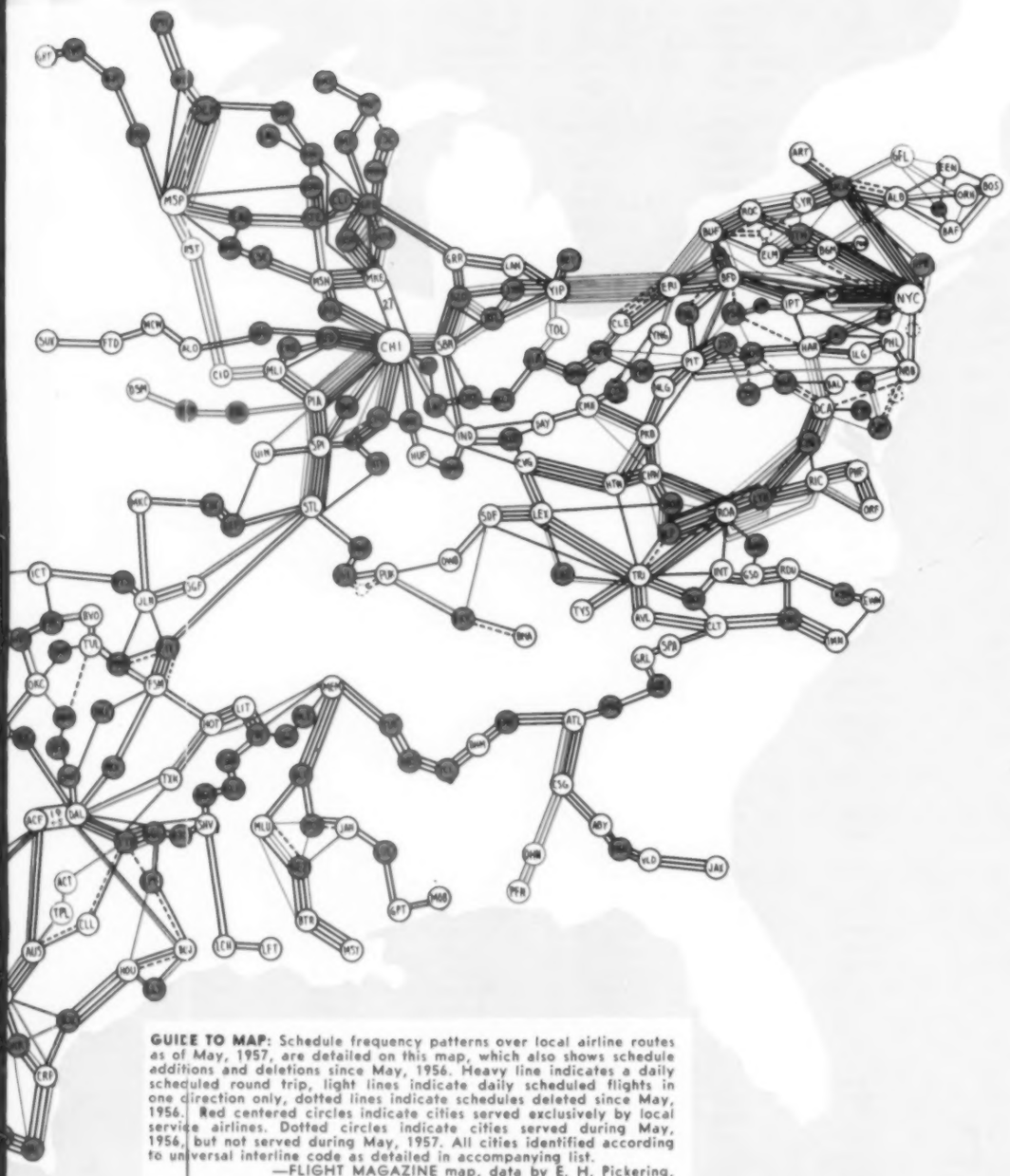
Universal Interline Code for Cities

ABE—Allentown-Bethlehem, Pa.
ABI—Abilene, Texas
ABQ—Albuquerque, N. M.
ABR—Aberdeen, S. Dak.
ABY—Albany, Ga.
ACF—Ft. Worth, Texas
ACK—Nantucket, Mass.
ACT—Waco, Texas
ACV—Eureka-Arcata, Calif.
ADH—Ada, Okla.
ADS—Anderson-Muncie, Ind.
AEL—Albert Lea, Minn.
AEX—Alexandria, La.
AFD—Ardmore, Okla.
AGO—Magnolia, Ark.
AGS—Augusta, Ga.
AHN—Athens, Ga.
AIA—Alliance, Neb.
ALB—Albany-Schenectady, N. Y.
ALM—Alamogordo, N. M.
ALO—Waterloo, Iowa
ALS—Alamosa, Colo.
ALW—Walla Walla, Wash.
AMA—Amarillo, Texas
ANB—Anniston, Ala.
AND—Anderson, S. C.
AOE—Victoria, Texas
AOO—Altoona-Martinsburg, Pa.
APN—Alpena, Mich.
ART—Watertown, N. Y.
ASL—Marshall, Texas
AST—Astoria, Ore.
ATL—Atlanta, Ga.
ATY—Watertown, S. D.
AUM—Austin, Minn.
AUS—Austin, Texas
AUW—Wausau, Wis.
AVL—Asheville-Hendersonville, N. C.
AVP—Wilkes Barre-Scranton, Pa.
AXN—Alexandria, Minn.
AYS—Waycross, Ga.
AZO—Kalamazoo, Mich.
BAF—Springfield-Westfield, Mass.
BAL—Baltimore, Md.
BBD—Brady, Texas
BDL—Hartford, Conn.-Springfield, Mass.
BDR—Bridgeport, Conn.
BEH—Benton Harbor, Mich.
BFD—Bradford, Pa.
BFL—Bakersfield, Calif.
BGD—Borger, Texas
BGM—Binghamton-Johnson City, N. Y.
BGS—Big Spring, Texas
BHM—Birmingham, Ala.
BIE—Beatrice, Neb.
BIL—Billings, Mont.
BIS—Bismarck, N. D.
BJI—Bemidji, Minn.
BKD—Breckenridge, Texas
BKE—Baker, Ore.
BKW—Beckley, W. Va.
BKX—Brookings, S. D.
BLF—Bluefield-Princeton, W. Va.
BLH—Blythe, Calif.
BLI—Bellingham, Wash.
BMG—Bloomington, Ind.
BMI—Bloomington, Ill.
BNA—Nashville, Tenn.
BNO—Burns, Ore.
BOI—Boise, Idaho
BOS—Boston, Mass.
BRD—Brainerd, Minn.
BRL—Burlington, Iowa
BRO—Brownsville, Texas
BTL—Battle Creek, Mich.
BTM—Butte, Mont.
BTR—Baton Rouge, La.
BTV—Burlington, Vt.
BUF—Buffalo, N. Y.
BUJ—Beaumont-Port Arthur, Texa
BUR—Burbank, Calif.
BVO—Bartlesville, Okla.
BVY—Bryan-Defiance, Ohio
BWD—Brownwood, Texas
BWG—Bowling Green, Ky.
BXA—Bogalusa, La.
BYI—Burley-Rupert, Idaho
BZN—Bozeman, Mont.
CAE—Columbia, S. C.
CAK—Akron-Canton, Ohio
CBE—Cumberland, Md.

ne Route and Schedule Pattern

MAY, 1957



GUIDE TO MAP: Schedule frequency patterns over local airline routes as of May, 1957, are detailed on this map, which also shows schedule additions and deletions since May, 1956. Heavy line indicates a daily scheduled round trip, light lines indicate daily scheduled flights in one direction only, dotted lines indicate schedules deleted since May, 1956. Red centered circles indicate cities served exclusively by local service airlines. Dotted circles indicate cities served during May, 1956, but not served during May, 1957. All cities identified according to universal interline code as detailed in accompanying list.

—FLIGHT MAGAZINE map, data by E. H. Pickering, cartography by Margaret Adams.

ise, Idaho
oston, Mass.
ainerd, Minn.
rlington, Iowa
rownsville, Texas
ttle Creek, Mich.
utte, Mont.
ton Rouge, La.
rlington, Vt.
ffalo, N. Y.
aumont-Port Arthur, Texas
rbank, Calif.
rtlesville, Okla.
yan-Defiance, Ohio
rownwood, Texas
owling Green, Ky.
galusa, La.
ley-Rupert, Idaho
zeman, Mont.
olumbia, S. C.
ron-Canton, Ohio
mberland, Md.

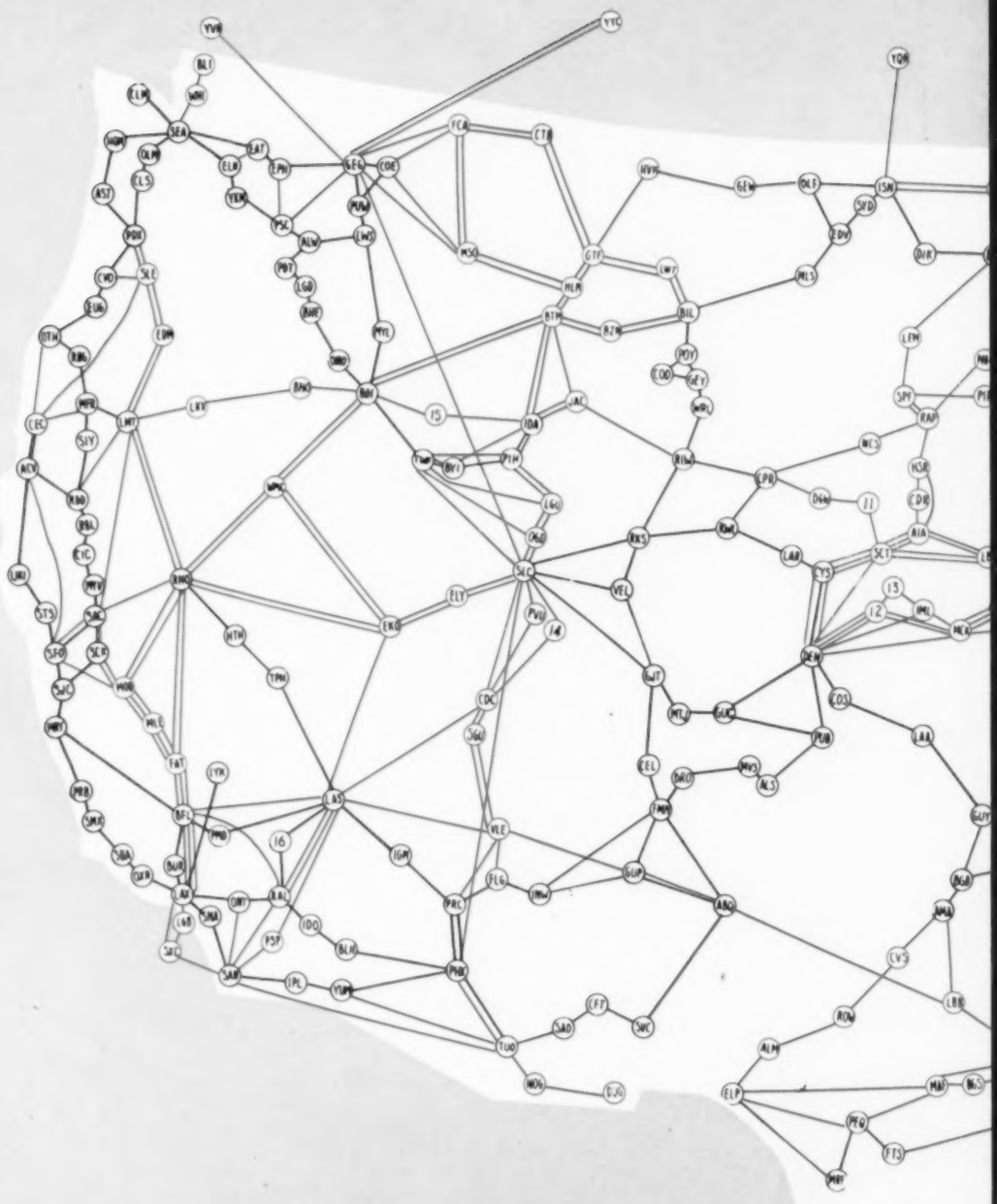
CBI—Columbia, Mo.
CDC—Cedar City, Utah
CDN—Camden, Ark.
CDR—Chadron, Neb.
CEC—Crescent City, Calif.
CEZ—Cortez, Colo.
CFT—Clifton-Morenci, Ariz.
CGI—Cape Girardeau, Mo.
CHA—Chattanooga, Tenn.
CHI—Chicago, Ill.
CHO—Charlottesville, Va.
CHS—Charleston, S. C.
CHW—Charleston, W. Va.
CIC—Chico, Calif.
CID—Cedar Rapids, Iowa
CKB—Clarksburg, W. Va.
CKM—Clarksdale, Miss.
CKV—Clarksville, Tenn.
CLE—Cleveland, Ohio
CLI—Clintonville, Wis.
CLL—Bryan-College Station, Texas
CLM—Port Angeles, Wash.

CLS—Chehalis-Centralia, Wash.
CT—Charlotte, N. C.
CLU—Columbus, Ind.
CMH—Columbus, Ohio
CMI—Champaign-Urbana, Ill.
CMX—Hancock-Houghton, Mich.
COD—Cody, Wyo.
COE—Coeur d'Alene, Idaho
COM—Coleman, Texas
COS—Colorado Springs, Colo.
CPR—Casper, Wyo.
CRP—Corpus Christi, Texas
CSG—Columbus, Ga.
CTB—Cut Bank, Mont.
CVG—Cincinnati, Ohio
CVO—Albany-Corvallis, Ore.
CVS—Clovis, N. M.
CWI—Clinton, Iowa
CYS—Cheyenne, Wyo.
DAB—Daytona Beach, Fla.
DAL—Dallas, Texas
DAN—Danville, Va.

DAY—Dayton, Ohio
DBL—Devils Lake, N. D.
DBQ—Dubuque, Iowa
DCA—Washington, D. C.
DEC—Decatur, Ill.
DEN—Denver, Colo.
DET—Detroit, Mich. City Airport
DGW—Douglas, Wyo.
DHN—Dothan, Ala.
DIK—Dickenson, N. D.
DH—Duluth, Minn.-Superior, Wisc.
DNV—Danville, Ill.
DOV—Dover, Delaware.
DRO—Durango, Colo.
DSM—Des Moines, Iowa
DUC—Duncan, Okla.
DUG—Douglas-Bisbee, Ariz.
EAR—Kearney, Neb.
EAT—Wenatchee, Wash.
EAU—Eau Claire, Wisc.
EEN—Keene, N. H.

EKN—Elkins, W. Va.
EKO—Elko, Nev.
ELD—El Dorado, Ark.
ELM—Elmira-Corning, N. Y.
ELN—Ellensburg, Wash.
ELP—El Paso, Texas
ELY—Ely, Nevada
EMP—Emporia, Kans.
EPH—Ephrata-Moses Lake, Wash.
ERI—Erie, Pa.
ERV—Kerrville, Texas
ESC—Escanaba, Mich.
ESN—Easton-Cambridge, Md.
EUG—Eugene, Ore.
EVV—Evansville, Ind.
EWN—New Bern, N. C.
FAR—Fargo, N. D.
FAT—Fresno, Calif.
FAY—Fayetteville, N. C.
FCA—Kalispell, Mont.
FEF—Fergus Falls, Minn.
FKL—Franklin-Oil City, Pa.
FLG—Flagstaff, Ariz.
FLL—Ft. Lauderdale, Fla.
FMN—Farmington, N. M.
FNT—Flint, Mich.
FOD—Fort Dodge, Iowa
FSD—Sioux Falls, S. D.
FSM—Ft. Smith, Ark.
FST—Ft. Stockton, Texas
FWA—Ft. Wayne, Ind.
FYV—Fayetteville, Ark.
GAD—Gadsden, Ala.
GDV—Glendive, Mont.
GED—Georgetown, Del.
GEG—Spokane, Wash.
GEY—Greybull-Basin, Wyo.
GGG—Longview-Kilgore, Texas
GGW—Glasgow, Mont.
GJT—Grand Junction, Colo.
GLH—Greenville, Miss.
GLS—Galveston, Texas
GNV—Gainesville, Fla.
GON—New London, Conn.
GPT—Gulfport, Miss.
GRB—Green Bay, Wis.
GRD—Greenwood, S. C.
GRI—Grand Island, Neb.
GRL—Greenville, S. C.
GRR—Grand Rapids, Mich.
GRW—Greenwood, Miss.
GSO—Greensboro-High Point, N. C.
GTF—Great Falls, Mont.
GUC—Gunnison, Colo.
GUP—Gallup, N. M.
GUY—Guymon, Okla.
GYY—Gary, Ind.
HAR—Harrisburg, Pa.
HEE—Helena, Ark.
HEZ—Natchez, Miss.
HGR—Hagerstown, Md.
HIB—Hibbing-Chisholm, Minn.
HKY—Hickory, N. C.
HLG—Wheeling, W. Va.
HLN—Helena, Mont.
HOB—Hobbs, N. M.
HON—Huron, S. D.
HOT—Hot Springs, Ark.
HOU—Houston, Texas
HPN—White Plains, N. Y.
HQM—Hoquiam-Aberdeen, Wash.
HRL—Harlingen, Texas
HRO—Harrison, Ark.
HSG—Hastings, Neb.
HSR—Hot Springs, S. D.
HSV—Huntsville, Ala.
HTH—Hawthorne, Nev.
HTW—Ashland, Ky.-Huntington, W. Va.
HUF—Terre Haute, Ind.
HUT—Hutchinson, Kans.
HVR—Havre, Mont.
HYA—Hyannis, Mass.
IAG—Niagara Falls, N. Y.
ICT—Wichita, Kans.
IDA—Idaho Falls, Idaho
IDO—Indio, Calif.
IGM—Kingman, Ariz.
ILG—Wilmington, Del.
IML—Imperial, Neb.
IMN—Wilmington, N. C.
IMT—Iron Mountain, Mich.
IND—Indianapolis, Ind.
INL—International Falls, Minn.
INR—Sault Ste. Marie, Mich.
INT—Winston-Salem, N. C.
INW—Winslow, Ariz.
IOW—Iowa City, Iowa
IPL—El Centro, Calif.
IPT—Williamsport, Pa.
ISN—Williston, N. D.
ITH—Ithaca, N. Y.
IWD—Ironwood, Mich.
IYK—Inyokern, Calif.
JAC—Jackson, Wyo.
JAN—Jackson, Miss.
JAX—Jacksonville, Fla.
JBR—Jonesboro, Ark.
JEF—Jefferson City, Mo.
JHW—Jamestown, N. Y.
JLN—Joplin, Mo.
JMS—Jamestown, N. D.
JSA—Santa Ana, Calif.
JST—Johnstown, Pa.

Local Air Service R



GUIDE TO MAP: Existing local service air routes are shown in black on this map, which details in red lines all of the new route applications filed with the Civil Aeronautics Board prior to May 15, 1957. Parallel lines indicate either existing routes (black) or route applications (red) of more than one local service airline. Seven major cases presently under way, with at least three more to be started this year, will consider practically every red line shown, plus additional filings expected in the next few months. Cities are identified according to universal interline code as detailed in accompanying list.

—FLIGHT MAGAZINE map, data by E. H. Pickering, cartography by Margaret Adams.

JVL—Beloit-Janesville, Wis.
JXN—Jackson, Mich.
KSN—Kinston, N. C.
LAA—Lamar, Colo.
LAF—Lafayette, Ind.
LAL—Lakeland, Fla.
LAN—Lansing, Mich.
LAR—Laramie, Wyo.
LAS—Las Vegas, Nev.
LAW—Lawton-Ft. Sill, Okla.
LAX—Los Angeles, Calif.
LBB—Lubbock, Texas
LBL—Liberal, Kans.
LEM—Lemmon, S. D.
LEX—Lexington-Frankfort, Ky.
LFK—Lufkin, Texas
LFT—Lafayette-New Iberia, La.
LGD—LaGrande, Ore.
LGU—Logan, Utah
LHV—Lock Haven, Pa.
LIA—Lima, Ohio
LIT—Little Rock, Ark.
LKC—Lake Charles, La.
LKV—Lakeview, Ore.
LMT—Klamath Falls, Ore.
LNK—Lincoln, Neb.
LNS—Lancaster, Pa.
LOZ—London-Corbin, Ky.
LRD—Laredo, Texas
LSE—La Crosse, Wis.
LUL—Laurel, Miss.
LWS—Lewiston, Idaho-Clarkston, Wash.
LWT—Lewiston, Mont.
LYH—Lynchburg, Va.
MAF—Midland-Odessa, Texas
MBG—Mobridge, S. D.
MBS—Saginaw-Bay City, Mich.
MCE—Merced, Calif.
MCK—McCook, Neb.
MCW—Mason City, Iowa
MEI—Meridian, Miss.
MEM—Memphis, Tenn.
MFD—Mansfield, Ohio
MFR—Medford, Ore.
MGM—Montgomery, Ala.
MGR—Moultrie, Ga.
MGW—Morgantown, W. Va.
MHE—Mitchell, S. D.
MHK—Manhattan, Kans.
MIA—Miami, Fla.
MKC—Kansas City, Mo.
MKE—Milwaukee, Wis.
MKG—Muskegon, Mich.
MKL—Jackson, Tenn.
MKO—Muskogee, Okla.
MKT—Mankato, Minn.
MLB—Melbourne, Fla.
MLC—McAlester, Okla.
MLI—Quad-Cities (Moline), Ill.
MLS—Miles City, Mont.
MLU—Monroe, La.
MMK—Mission-McAllen, Texas
MNM—Marinette, Wis.-Menominee, Mich.
MOB—Mobile, Ala.
MOD—Modesto, Calif.
MOT—Minot, N. D.
MQT—Marquette, Mich.
MRF—Marfa-Alpine, Texas
MRY—Monterey-Del Monte, Calif.
MSL—Muscle Shoals-Florence, Ala.
MSN—Madison, Wis.
MSO—Missoula, Mont.
MSP—Minneapolis-St. Paul, Minn.
MSS—Massena, N. Y.
MSY—New Orleans, La.
MTJ—Montrose-Delta, Colo.
MTO—Mattoon-Charleston, Ill.
MTW—Manitowoc, Wis.
MVS—Monte Vista, Colo.
MVY—Martha's Vineyard, Mass.
MWA—Marion-Herrin, Ill.
MWL—Mineral Wells, Texas
MYL—McCall, Idaho
MYR—Myrtle Beach, S. C.
MYV—Marysville-Yuba City, Calif.
MZZ—Marion, Ind.
NBB—Atlantic City, N. J.
NCS—Newcastle, Wyo.
NHV—New Haven, Conn.
NOG—Nogales, Ariz.
NYC—New York, N. Y.
OCF—Ocala, Fla.
OFK—Norfolk, Neb.
OGD—Ogden, Utah
OGS—Ogdensburg, N. Y.
OKC—Oklahoma City, Okla.
OKK—Kokomo, Ind.
OLM—Olympia, Wash.
OMA—Omaha, Neb.
ONA—Winona, Minn.
ONO—Ontario, Ore.
ORF—Norfolk, Va.
ORH—Worcester, Mass.
ORL—Orlando, Fla.
OSH—Oshkosh, Wis.
OTH—North Bend-Coos Bay, Ore.
OTM—Ottumwa, Iowa
OWB—Owensboro, Ky.
OXR—Oxnard-Ventura, Calif.
PBF—Pine Bluff, Ark.
PBI—West Palm Beach, Fla.
PDT—Pendleton, Ore.
PDX—Portland, Ore.
PEQ—Pecos, Texas
PFN—Panama City, Fla.
PHD—New Philadelphia-Dover, Ohio
PHF—Newport News, Va.
PHL—Philadelphia, Pa.
PHN—Port Huron, Mich.
PHX—Phoenix, Ariz.
PIA—Peoria, Ill.
PIH—Pocatello, Idaho
PIR—Pierre, S. D.
PIT—Pittsburgh, Pa.
PKB—Parkersburg, W. Va.-Marietta, Ohio
PLN—Cheboygan, Mich.
PMD—Palmdale-Petoskey, Calif.
PMH—Portsmouth, Ohio
PNC—Ponca City, Okla.
PNS—Pensacola, Fla.
POU—Poughkeepsie, N. Y.
POY—Powell-Lovell, Wyo.
PRB—Paso Robles-San Luis Obispo, Calif.
PRC—Prescott, Ariz.
PRX—Paris, Texas
PSB—Bellefonte-Pittsburgh-State College, Pa.
PSC—Pasco-Kennewick-Richland, Wash.
PSF—Pittsfield, Mass.
PSP—Palm Springs, Calif.
PTS—Pittsburg, Kans.
PUB—Pueblo, Colo.
PUK—Paducah, Ky.
PUW—Pullman, Wash.-Moscow, Idaho
PVD—Providence, R. I.
PVU—Provo, Utah
RAP—Rapid City, S. D.
RBG—Roseburg, Oregon
RBL—Red Bluff, Calif.
RDD—Redding, Calif.
RDG—Reading, Pa.
RDM—Bend-Redmond, Ore.
RDU—Raleigh-Durham, N. C.
RFD—Rockford, Ill.
RHI—Rhinelander, Wis.
RIC—Richmond, Va.
RID—Richmond, Ind.
RIW—Riverton-Lander, Wyo.
RKS—Rock Springs, Wyo.
RNO—Reno, Nevada
ROC—Rochester, N. Y.
ROW—Roswell, N. M.
RST—Rochester, Minn.
RWL—Rawlins, Wyo.
SAC—Sacramento, Calif.
SAD—Safford, Ariz.
SAF—Santa Fe, N. M.
SAN—San Diego, Calif.
SAT—San Antonio, Texas
SBA—Santa Barbara, Calif.
SBN—South Bend, Ind.
SBY—Salisbury-Ocean City, Md.
SCK—Stockton, Calif.
SCT—Scottsbluff, Neb.
SDF—Louisville Ky.
SDY—Sidney, Mont.
SEA—Seattle-Tacoma, Wash.
SES—Selma, Ala.

ute Pattern with Proposed Extensions

MAY 15, 1957

FO—San Francisco, Calif.
GF—Springfield, Mo.
GT—Stuttgart, Ark.
GU—St. George, Utah
HV—Shreveport, La.
IY—Yreka, Calif.
JC—San Jose, Calif.
JT—San Angelo, Texas
KY—Sandusky, Ohio
LC—Salt Lake City, Utah
LE—Salem, Ore.
LN—Salina, Kans.
MX—Santa Maria, Calif.
NA—Santa Ana-Laguna Beach, Calif.
OP—Southern Pines-Aberdeen-Pinehurst, N. C.
PA—Spartanburg, S. C.
PF—Spearfish, S. D.
PI—Springfield, Ill.
PS—Wichita Falls, Texas
TE—Stevens Point-Wisconsin Rapids, Wis.
TJ—St. Joseph, Mo.
STL—St. Louis, Mo.
STS—Santa Rosa, Calif.
SUX—Sioux City, Iowa
SVC—Silver City-Hurley, N. M.
SWI—Sherman-Denison, Texas
SWO—Stillwater, Okla.
SYR—Syracuse, N. Y.
TCL—Tuscaloosa, Ala.
TLH—Tallahassee, Fla.
TOL—Toledo, Ohio
TOP—Topeka, Kans.
TPA—Tampa, Fla.
TPH—Tonopah, Nev.
TPL—Temple, Texas
TRI—Bristol, Va.-Johnson City-Kingsport, Tenn.
TTN—Trenton, N. J.
TUL—Tulsa, Okla.
TUO—Tucson, Ariz.
TUP—Tupelo, Miss.
TVC—Traverse City, Mich.
TVF—Thief River Falls, Minn.
TWF—Twin Falls, Idaho
TXK—Texarkana, Ark.
TYR—Tyler, Texas
TYS—Knoxville, Tenn.
UBS—Columbus, Miss.
UCA—Utica, N. Y.
UIN—Quincy, Ill.
UKI—Ukiah, Calif.
VEL—Vernal, Utah
VKS—Vicksburg, Miss.
VLD—Valdosta, Ga.
VLE—Grand Canyon, Ariz.
VPS—Eglin AFB, Fla.
VRB—Vero Beach, Fla.
WDG—Enid, Okla.
WEE—Wenatchee, Wash.
WHI—Whidbey Island, Wash.
WMC—Winnemucca, Nev.
WRL—Worland, Wyo.
WWD—Cape May-Wildwood, N. J.
YIP—Detroit, Mich.
YKM—Yakima, Wash.
YKN—Yankton, S. D.
YNG—Youngstown-Warren, Ohio
YQR—Regina, Sask., Can.
YQT—Fort William, Ont., Can.
YUM—Yuma, Ariz.
YVR—Vancouver, Br. Col., Can.
YYC—Calgary, Alberta, Can.
YYZ—Toronto, Ontario, Can.
ZZV—Zanesville, Ohio
1—Olean, N. Y.
2—Meadville, Pa.
3—Anderson-New Castle-Muncie, Ind.
4—Decatur, Ala.
5—Morgan City, La.
6—Oxford, Miss.
7—DeRidder, La.
8—Moberly, Mo.
9—Clarinda, Iowa
10—Worthington, Minn.
11—Lusk, Wyo.
12—Sterling, Colo.
13—Sydney, Neb.
14—Richland, Utah
15—Sun Valley, Idaho
16—Apple Valley, Calif.

Directory of Local Service Airlines

L. O. Barnes

Allegheny Airlines, Inc.

Washington National Airport, Hangar No. 12, Washington, D. C.

First scheduled service started Mar. 7, 1949. Now serving 50 cities, 2,205 system route miles, 15 Douglas DC-3's and 6 Martins, 725 employes.

President: Leslie O. Barnes.
VP-Traffic & Sales: David L. Miller.
VP-Treas.: Walter J. Short.
VP-Scty.: Everett K. Arnold.
VP-Asst. to Pres.: R. G. Dinning.
Dir. Sales: J. K. Svitzer.
Psgr. Svc. Rep.: B. Clark.
Reg. Sales Mgrs.: E. F. Bracken, Pittsburgh; J. R. Luke, Philadelphia; W. J. Meyers, New York City; G. Swearingen, Cleveland; L. T. Ferguson, Harrisburg; J. H. Hiller, Washington.
Dir. Reservations: F. L. Mulvey.
Mgr. Scheds. & Tariffs: G. N. Spooner.
Asst. Controller: W. D. Hay.
Asst. Treas.: G. Gerth.
Dir. Supply: R. C. Gudikunst.
Pur. Agent: G. J. Lostetter.
Dir. Personnel: E. K. Arnold.
Sup. Print Shop: R. A. Hayes.
Dir. Research: J. R. Schrenk.
Dir. Stations: Robert C. Schumm.
Dir. Ops.: H. M. Thompson.
Crew Scheduler: T. Meehan.
Dir. Maint.: L. L. Hilliard.
Chf. Inspector: L. Johnson.
Chairman: Robert M. Love.
Corp. Counsel: Hale, Stimson, Russell & Nickerson.
Research Consult.: Gotch & Crawford.

Ed Converse

Bonanza Air Lines, Inc.

P. O. Box 391 McCarran Field Las Vegas, Nevada

First scheduled service started Aug. 6, 1946. Now serving 17 cities, 1,663 system route miles, 9 Douglas DC-3's, (6 Fairchild F-27's on order), 342 employees.

Chairman: L. G. McNeil.
President: Edmund Converse.
VP-Scty.: Florence J. Murphy.
Exec. VP: G. Robert Henry.
VP-Traffic & Sales: Wm. J. Mitchell.
VP-Ops.: Myron W. Reynolds.
VP-Treas.: R. H. Herrnstein.
Public Relations: Jack Arant.
Gen. Traffic Mgr.: C. W. Russell.
Asst. VP-Sales: Larry Decker.
Asst. Treas.: Robert Sherer.
Acctng. Sup., Rev.: Zella Smith.
Asst. Personnel Dir.: John Longwill.
Mgr. Stores: Harry Burt, Sr.
Supt. Pur. & Stores: Earl Hall.
Sup. Print Shop: Frankie Kelley.
Supt. Stations: Bernard Novia.
Div. Chf. Pilots: Paul Beach, C. H. Ferguson.
Chf. Stewardess: Helene Schulte.
Supt. Maint.: George Davis.
Chf. Insp.: Jack O'Dell.
Supt. Comms.: Roger Mohr.
Sup. Reservations: Betty Jones.
Reg. Sales Mgrs.: R. J. Murray, Calif.; Bruce Ryan, Ariz.
Dist. Sales Mgrs.: Phil Mench, Reno; Robert Busseau, Ontario.
Wash. Counsel: W. C. Burt and Al Grisard.

Keith Kahle

Central Airlines, Inc.

Meacham Field, Ft. Worth, Texas

First scheduled service started Sept. 15, 1949. Now serving 29 cities, 3,299 system route miles, 12 Douglas DC-3's, 420 employes.

Chairman: F. Kirk Johnson.
President: Keith Kahle.
Ex. VP-Treas.: F. E. Howe.
VP-Traffic. & Sales: A. S. Aldridge.
Mgr. Ops.: R. L. Wageneck.
Asst. Sales Mgr.: W. A. Rollins.
Mgr. Interline & Agency Sales: R. G. Archey.
Mgr. Mil. Transp.: R. G. Wagley.
Mgr. Psgr. Svc.: J. W. Force, Jr.
Dist. Sales Reps.: H. F. Harburck, Dallas-Ft. Worth; J. P. Jones, Kansas City; V. R. Westbrook, Oklahoma City; B. L. Rainwater, St. Louis; H. Branham, Denver.
Traffic Mgr.: J. C. Dixson.
Sales Prom. Mgr.: G. L. Wysatta.
Asst. Treas.: C. E. Lundstrom.
Internal Auditor: H. E. Dalrymple.
Acctng. Sup., Gen.: F. E. Mancuso.
Acctng. Sup., Rev.: R. J. Clauser.
Pur. Agent: A. C. Terrill.
Mgr. Stores: H. W. Nelson.
Dir. Personnel: M. J. Baron.
Sup. Print Shop: T. M. Lane.
Research: E. A. Saltry.
Supt. Stations: T. W. Jones.
Dir. Flt. Ops.: W. A. Whitlock.
Chf. Flt. Supt.: R. R. Conner.
Chf. Stewardess: Thelma Doyle.
Dir. Maint.: D. S. Vaughn.
Supt. Maint.: F. N. Walsh.
Chf. Inspector: W. E. Beck.
Supt. Comms.: R. E. Wilson.
Sup. Reservations: Francene Morris.
Corp. Counsel: Hudson, Keltner & Sarsgard.
Wash. Counsel: Pogue & Neal.
Res. Consultant: E. H. Pickering.

C. A. Myhre

Frontier Airlines, Inc.

Stapleton Airfield Denver 7, Colorado

First scheduled service started Nov. 27, 1947. Now serving 40 cities, 3,647 system route miles, 15 Douglas DC-3's, 691 employees.

Chairman: Ben Regan.
President: C. A. Myhre.
VP-Traff. & Sales: John D. Lindsay.
Dir. Ops.: William R. Crismon.
Dir. Sales Adm.: Chet Lubben
Sales Prom. Mgr.: Tom Makurat.
Psgr. Svc. Mgr.: Jas. B. Montgomery
Dist. Sales Mgrs.: Gordon Dahl, Denver; Melvin A. Brandt, Billings; Don Boyle, Bismarck; Dex Alger, Salt Lake City; Vern Carlson, Grand Junction; Tom Morris, Albuquerque; Earl Passwater, Phoenix.
Sales Rep.: George Naglich.
Dir. Public Rels.: G. S. Kitchen.
Publicity: Edward H. Gerhardt.
Chf. Accountant: Dale W. Rausch.
Acctng. Sup., Gen.: Dale W. Rausch.
Acctng. Sup., Rev.: Karl K. Leonard.
Mgr. Stores: Floyd Lauderman.
Pur. Agent: Bernard E. Foster.
Dir. Personnel: Alban J. Schmidt.
Dir. Research: John Clark Coe.
Supt. Stations: Elton L. Snoke.
Reg. Sups.: Harold E. Davis, Billings; John G. Griffiths, Phoenix, and Virgil L. Alvey, Denver.
Dir. Flt. Ops.: Everett L. Aden.
Chf. Stewardess: Geri Anderson.
Acting Dir. Maintenance: Harvey P. Barnard, Jr.
Supt. Maintenance: Harry E. Russell.
Chf. Insp.: Harry G. Summerton.
Supt. Comms.: Clyde Longhart.
Sup. Resv.: William R. Monday.
Corp. Counsel: Scott C. Whitney.
Wash. Counsel: Bown and Scoutt.

Gwin Hicks

Lake Central Airlines, Inc.

Weir Cook Municipal Airport Indianapolis 44, Ind.

First scheduled service started Nov. 7, 1949. Now serving 31 cities, 2,285 system route miles, 10 Douglas DC-3's, 345 employes.

Chairman: Dr. Robert B. Stewart.
President: Gwin Hicks.
Exec. VP: Lloyd W. Hartman.
VP-Traffic & Sales: D. S. Getchell.
VP-Ops.: Robert W. Clifford.
Asst. Treasurer: J. L. Cory.
Mgr. Tariffs, Sched.: Wm. R. Roth.
Dir. Public Rels.: James Humphrey.
Reg. Dir. Pub. Rels.: M. T. Blaney.
Accounting Sup., Gen.: Ada Royer.
Acctng. Sup., Rev.: J. P. Berfanger.
Chf. Storekeeper: Robert Campbell.
Pur. Agent: C. L. Desterbecque.
Dir. Ec. Research: M. M. ErSelcuk.

Chief Pilot: A. E. Sabo.
Chief Dispatcher: A. E. Woolley.
Supt. Maint.: H. A. Petty.
Psgr. Svc. Mgr.: Robert D. Collins.
Supt. Comms.: Charles Hildebrand.
Sup. Reservations: Juergen Ballast.
Corp. Counsel: Wm. Krieg.
Wash. Counsel: Albert Grisard.

R. E. Peach

Mohawk Airlines,
Utica, New York

First scheduled service started April 6, 1945. Now serving 32 cities, 1,581 system route miles, 11 Douglas DC-3's and 11 Convair 240's, 750 employes.

Chairman: E. Victor Underwood.
President: Robert E. Peach.
VP-Gen. Counsel: John R. Carver.
VP-Ops.: Carl A. Benscoter.
VP-Sales: Thomas J. Kirkup.
Secretary: Bruce C. McLean.
Treasurer: E. Victor Underwood.
Dir. Research: David E. Postle.
Dir. Employee Rels.: R. V. Stephenson.
Dir. Press Rels.: Leo E. Murphy.
Dir. Community Rels.: R. T. Sidney.
Gen. Traffic Mgr.: Lee W. Holmes, Jr.
Dir. Statistics: R. P. Sherwood.
Dir. Scheds. & Tariffs: DeHart B. Clute.
Dr. Flt. Ops.: Robert W. Jenkins.
Supt. Comms.: Remington R. Taylor.
Supt. Maint. & Eng.: E. A. Butterfield.
Chf. Inspector: W. R. Nark.
Dir. Purchasing: Glenn W. Irish.

H. N. Carr

North Central Airlines, Inc.
6201 34th Avenue South, Minneapolis 50, Minnesota

First scheduled service started Feb. 24, 1948. Now serving 51 cities, 3,240 system route miles, 26 Douglas DC-3's, 1,071 employes.

Chairman: Arthur E. A. Mueller.
President: Hal N. Carr.
VP-Traffic & Sales: F. N. Buttomer.
VP-Ops.: A. D. Niemeyer.
VP-Ind. Rels.: A. E. Schwandt.
VP-Maint. & Engrng.: R. H. Bendio.
Vice President: A. L. Wheeler.
Scty.-Treas.: Bernard Sweet.
Traff. Adm. Mgr.: Robert Erdmann.
Psgr. Svc. Mgr.: John Minerich.
Tariffs & Scheds. Mgr.: C. B. Vesper.
Dist. Sales Reps.: John Hammer, Don LaMont, Jim Palm, Eugene Leonard, Robert Shook, Erling Nasset.
Pub. Rels. Mgr.: David A. Moffitt.
Acctng. Sup., Gen.: Dan May.
Machine Acct. Sup.: W. E. Wolf.
Acctng. Sup., Rev.: Donald Sonnichsen.
Properties Mgr.: John Dow.
Purchasing Agent: Gordon Bullis.
Supt. Stations: T. M. Needham.
Chf. Flt. Supt.: Joseph Sims.
Chf. Stewardess: Kathy Leddick.
Chf. Pilot: G. F. Wallis.
Supt. Maint.: Robert L. Gren.
Chf. Engineer: Ralph Roberts.
Chf. Inspector: Harold Ebelt.
Overhaul Supt.: G. Roycraft.
Electronics Supt.: A. Warner.
Sup. Reservations: Marvin J. Freund.
Wash. Counsel: A. L. Wheeler.

L. H. Hamilton

Ozark Air Lines, Inc.
Lambert Field
St. Louis 21, Mo.

First scheduled service started Sept. 26, 1950. Now serving 48 cities, 3,556 system route miles, 20 Douglas DC-3's, 800 employees.

Chairman: Barak T. Mattingly.
President: Laddie H. Hamilton.
Treasurer: Floyd W. Jones.
Secretary: Arthur G. Heyne.
Asst. to Pres.: Miss Lee Spence.
Dir. Pub. & Intrln. Rels.: Paul J. Rodgers.
Dir. Adv. & Pub.: Francis M. Higgins.
Adv. Mgr.: Earl E. Bowman, Jr.
Ops. Mgr.: F. E. Myers.
Psgr. Svc. Mgr.: Tom Keyes.
Gen. Traffic Mgr.: C. L. Tabor.
Traffic Mgr.: Henry L. Sweezy; Asst.: D. G. Weishaar.
Gen. Sales Mgr.: S. F. McCullough.
Reg. Mgrs.: Dean Holscher, Chicago; Richard Hannon, Central; E. A. (Joe) May, Northwest; Charles Johnson, Southwest; Vince R. O'Brien, Southeast.
Supt. Maint.: Ellwyn E. Boock.
Supt. Comms.: Phillip L. Newell.
Supt. Flt. Ops.: Julian A. Wiggins.
Chf. Pilot: Jack O'Brien.
Chf. Insp.: Walter Elliott.
Supt. Stations: C. C. Mounts.
Chf. Flt. Supt.: Wm. E. Enochs.
Comptroller: E. H. Herndon.
Chf. Accountant: Edward Crane.
Pur. Agent: Rex E. Creighton.
Sup. Print Shop: Ralph Jung.
Sup. Res.: Mrs. Connie Mounts.
Legal Counsel: James Verner and James Batchelor.

Tom Davis

Piedmont Airlines
Smith Reynolds Airport, Winston-Salem 1, N. C.

First scheduled service started Feb. 20, 1948. Now serving 50 cities, 3,173 system route miles, 21 Douglas DC-3's, 846 employes.

Pres. & Treas.: T. H. Davis.
Vice Presidents: C. G. Brown, Jr. H. K. Saunders, R. S. Northington (fixed-base division).
Secretary: M. F. Fare.
Gen. Sales Mgr.: W. G. McGee.
Gen. Traffic Mgr.: R. E. Turbiville.
Dir. Sales Prom. & Agencies: H. B. Slater.
Dist. Sales Mgrs.: J. L. Wathen, D. G. Edmondson, R. J. Miller, G. W. Bennett, H. L. Warner, J. A. Humphreys.
City Sales Mgrs.: S. C. Folger, P. D. Loar.
Sales Rep.: W. A. Crowe.
Supt. Stations: K. E. Ross.
Div. Station Supervisors: E. T. Best, C. B. Nutt, P. P. Jones, T. R. Cowen.
Chf. Acct.: T. W. Morton.
Mgr., Rev. Acctng.: C. H. McCall.
Pur. Agent: W. W. Barber.
Chf. Pilot: F. C. Nicholson.
Supt. Psgr. Svc.: S. S. Brunt.
Supt. Maint.: H. M. Cartwright.
Supt. Comms.: L. A. Watson.
Asst. to VP: J. W. Lewis.
Sup. Grnd. Ops.: W. A. Blackmon.
Chf. Inspector: L. H. Jackson.
Gen. Counsel: Kilpatrick, Ballard & Beasley.

F. W. Hulse

Southern Airways, Inc.
Atlanta Airport
Atlanta, Ga.

First scheduled service started June 10, 1949. Now serving 30 cities, 1,936 system route miles, 13 Douglas DC-3's, 500 employees.

President: Frank W. Hulse.
Vice President: Ike F. Jones.
VP-Sales: C. M. Britt.
VP-Ops.: W. S. Magill, Jr.
Secty-Treas.: Geo. F. Estey.
Asst. Treas.: C. H. D. Tarrer.
Sales Prom. Mgr.: A. D. Yawn.
Dir. Mil. Transpt., M. W. Nolan
Supt. Psgr. & Flt. Sve.: G. H. O'Brien.
Dist. Sales Mgrs.: Harold Goodson, R. E. Kale, Perry Wingo, J. O. Lasseter and Ben E. Bowie.
Traff. Mgr.: Fred A. Shine.
Acctng. Sup., Gen.: R. W. Burden.
Dir. Research: J. K. Courtenay.
Pur. Agent: R. C. Suttles, Jr.
Personnel Dir.: R. W. DesRochers.
Sup. Print Shop: Oliver Harris.
Supt. Stations: George F. Attwood.
Chief Pilot: W. B. Brubb.
Chf. Stewardess: Mrs. Barbara Spires
Supt. Maint.: George Cross.
Chf. Insp.: Fred McMickle.
Chief Dispatcher: Truman Terry.
Supt. Comms.: W. C. Weigle.
Supt. Reservs. & Tck. Offices: D. R. Hankins.
Corp. Counsel: William B. White, Jr.
Wash. Counsel: Cecil A. Beasley, Jr.

(Continued on page 77)

Local Air Service, 1957

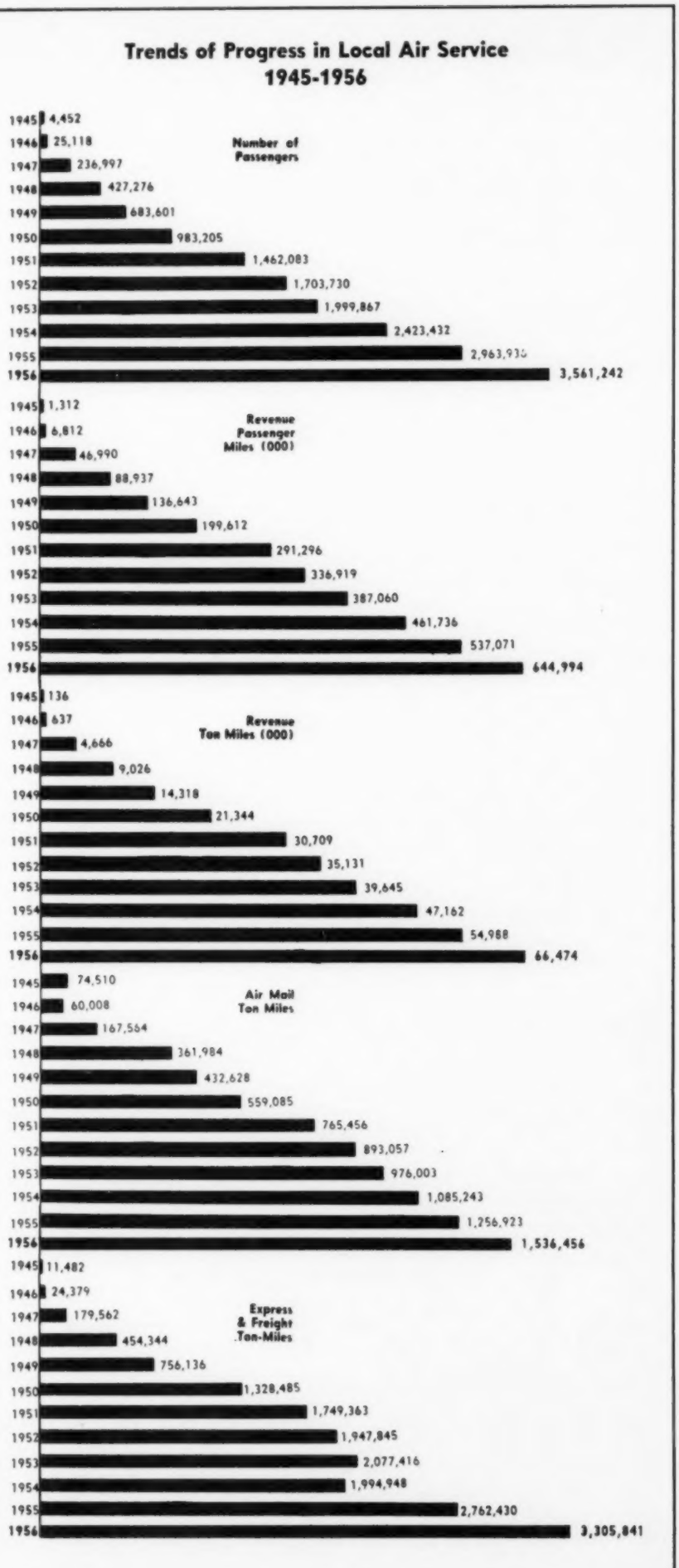
Re-appraisal of local service problems and progressive CAB action are needed to avert complete stagnation

FOR more than ten years this nation, through properly constituted authority, has established and enjoyed a basic secondary system of scheduled air transportation serving small and medium size communities for the public's convenience and necessity and for the postal service and in the interest of national defense.

The oldest carrier is now in its eleventh year of operation, the youngest in its sixth. The thirteen airlines, listed in sequence as to number of years in operation, are: Allegheny, Frontier, Southwest, West Coast, North Central, Mohawk, Piedmont, Trans-Texas, Southern, Central, Lake Central, Bonanza and Ozark. Operating under temporary certificates of convenience and necessity from their inception, they were permanently certificated through an Act of Congress in May, 1955.

In 1956 these thirteen regional short-haul air transport companies provided service to 458 towns and cities, some 261 of which were served exclusively by the locals. The 458 communities have a combined population of 54,000,000. Flying nearly 200 transport aircraft, the locals carried 3,500,000 passengers in 1956 for a 21 per cent gain over calendar 1955. Gross revenues increased by 17.7 per cent in 1956 and amounted to $67,380,000. This growth is consistent with the steady upward climb since this brand-new air traffic came into being shortly after World War II.

Not long ago, the vice chairman of the Civil Aeronautics Board pointed out that in 1955 the locals served almost 100 more airports, carried about 1,200,000 more passengers, and earned almost as much commercial or non-mail revenues as did all the sixteen trunklines in 1939. "Few people realize," he said, "how far the local service industry of today is ahead



of the entire trunkline industry as it existed prior to the outbreak of World War II."

This brings us to the greatest paradox in the entire history of transportation in this country. In spite of these constant gains in every phase of their operations, the locals are losing money and not one penny of financial return has ever been made to the common stockholders in the more than ten years we've had local air service!

The time has passed when the public and the government can waste time looking backward on the impressive record of local airline growth and development. The carriers themselves have demonstrated to the world that they have tried every possible way to reduce subsidy — to get off the dole which each year amounts to about $25 million. It is true that they keep providing *more* service each year for about the same amount of subsidy, expanding routes and schedules, and requiring less subsidy support in relation to the volume of services offered and traffic carried. In spite of spiraling costs and the creeping inflation that is gripping every business, the total subsidy requirement has remained relatively static. The locals are literally on the horns of a dilemma.

For a number of years the local carriers have been on what is called an "incentive formula," which was devised to give them a profit return at a certain level of operations. If the carrier grew by improving its load factor, the formula would split the additional revenue, theoretically permitting the carrier to better its earnings. But it turned out to be a mirage. In actual practice the formula took all the airline's earnings, in some cases more, and as service was expanded the formula cut the carrier down to the point where the formula has been virtually abandoned and all have had to go back to temporary mail rates for relief.

The carrier that skyrocketed to real success recently, coming up to top position from way down the line in amount of business done, and with the lowest unit operating costs, had to go off its permanent mail rate during the last few months because the formula had squeezed it down below the break-even point.

Other factors are involved, however. Despite tight-fisted management policies, the carriers' operating costs have been increasing steadily, primarily in labor, parts, materials and fuel. In a study by one particular airline it was discovered that forthcoming increased prices ranging from ten per cent to more than 200 per cent were indicated by suppliers of parts and materials bought in the day-to-day operation.

Many competent observers, students of local service operations, believe that the airline managements are trying too hard and are being unrealistic about getting off subsidy. Objective observers admit that these capable and hard-working people have left few stones unturned that would increase revenue and cut costs. They know of the midnight oil that's burned by these sincere operators to make ends meet. This vigorous attempt to get off the dole is worthy and commendable. It is doubly important to the carriers be-

Local Service Airline Growth, Revenues
Years 1945 through 1956

Year	Passenger Amount	Passenger % of Total	Total Non-Mail Amount	Total Non-Mail % of Total	Mail Pay Amount	Mail Pay % of Total
1945	$ 64,701	45.0	$ 65,874	45.8	$ 77,890	54.2
1946	314,638	29.2	348,903	32.4	728,179	67.6
1947	2,280,124	26.99	2,468,397	29.9	5,795,932	70.1
1948	4,666,549	32.9	4,996,550	35.2	9,207,621	64.8
1949	7,355,366	35.0	7,876,031	37.5	13,132,690	62.5
1950	10,196,781	37.6	11,393,129	42.0	15,741,612	58.0
1951	15,757,568	43.9	17,338,545	48.3	18,569,578	51.7
1952	19,172,025	46.6	20,573,899	50.0	20,602,272	50.0
1953	22,663,146	46.7	24,333,992	50.2	24,153,000	49.8
1954	27,673,195	50.6	29,821,463	54.5	24,893,753	45.5
1955	32,840,504	57.4	35,342,823	61.7	21,898,850	38.3
1956	40,165,958	59.3	43,392,973	64.1	24,318,037	35.9

—(Ray & Ray Compilation)

Local Service Airline Growth, Operations
Years 1945 through 1956

Year	Revenue Miles	Revenue Passengers	Revenue Passenger Miles (000)	Passenger Load Factor (%)	Revenue Ton Miles (000)	Ton Mile Util. Factor (%)
1945	310,783	4,452	1,312	52.76	136	42.50
1946	1,287,971	25,118	6,812	37.92	637	41.35
1947	8,354,787	236,997	46,990	30.08	4,666	31.93
1948	16,335,284	427,276	88,937	27.35	9,026	29.01
1949	24,208,377	683,601	136,643	28.51	14,318	30.90
1950	33,552,214	983,205	199,612	33.02	21,344	30.90
1951	37,797,136	1,462,083	291,296	38.20	30,709	35.30
1952	40,697,348	1,703,730	336,919	38.64	35,131	35.69
1953	45,085,915	1,999,867	387,060	39.47	39,645	35.67
1954	48,447,951	2,423,432	461,736	44.59	47,162	40.00
1955	51,802,611	2,963,936	537,017	47.99	54,988	43.26
1956	60,529,316	3,516,242	644,994	48.34	66,474	44.04

—(Ray & Ray Compilation)

Local Service Airlines Operating Expenses
Years 1945 through 1956

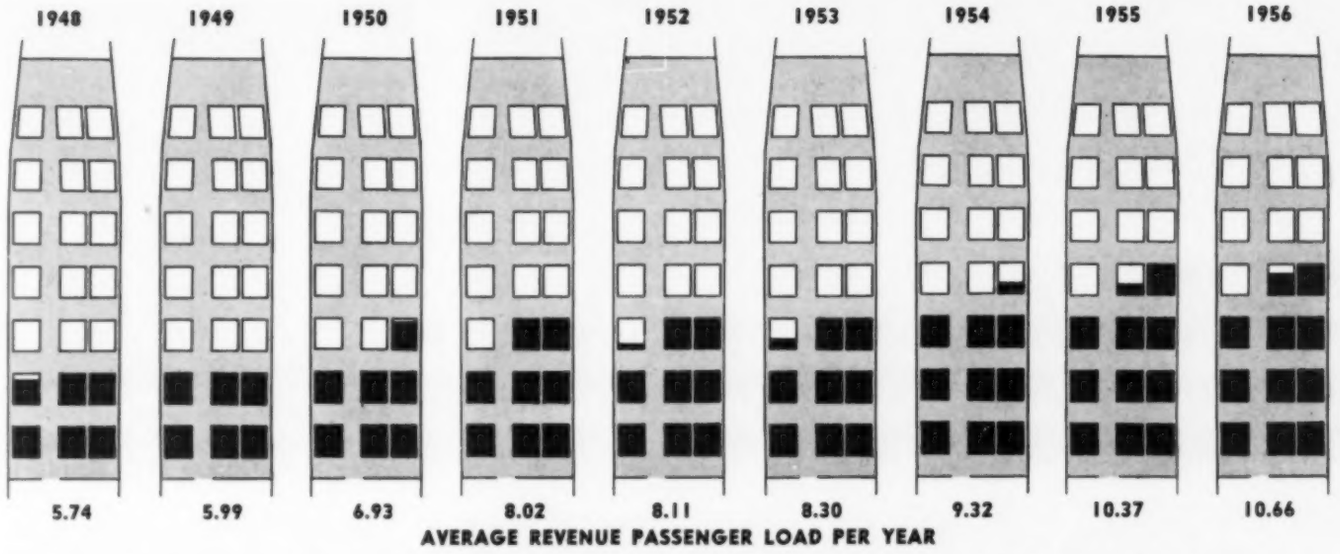
Year	Direct Aircraft Expense: Flying Operations	Maintenance—Flight Equip.	Depreciation—Flight Equip.	Total	Ground and Indirect Expense	Total Expense
1945	$ 56,415	$ 37,139	$ 16,517	$ 110,071	$ 117,222	$ 227,293
1946	268,304	187,430	107,600	563,334	640,040	1,203,374
1947	1,883,686	1,115,027	854,848	3,853,561	4,123,983	7,977,544
1948	4,134,962	2,072,832	1,303,563	7,511,357	6,995,512	14,506,869
1949	6,280,727	3,147,538	1,910,785	11,339,050	10,216,991	21,556,041
1950	8,422,726	3,463,246	1,492,366	13,378,338	13,731,864	27,110,202
1951	10,678,202	4,211,381	1,596,032	16,485,615	18,541,338	35,026,953
1952	13,116,658	5,351,865	2,070,486	20,539,009	21,970,066	42,509,075
1953	15,430,335	6,354,124	2,422,092	24,206,551	25,614,810	49,821,361
1954	17,246,089	5,950,087	1,893,201	25,089,377	28,016,163	53,105,540
1955	18,077,016	6,619,511	1,811,914	26,508,441	30,329,525	56,837,966
1956	21,615,379	8,284,666	2,090,057	31,990,102	36,349,167	68,339,269

—(Ray & Ray Compilation)

Local Service Airline Revenues and Expenses
Years 1945 through 1956
Cents Per Revenue Mile

Year	Revenues: Passenger	Total Non-Mail	Mail Pay	Total	Total Expense	Break Even Need
1945	20.82	21.20	25.06	46.26	73.14	51.94
1946	24.43	27.09	56.54	83.63	93.43	66.34
1947	27.29	29.55	69.37	98.92	95.48	65.93
1948	28.57	30.58	56.37	86.95	88.81	58.23
1949	30.38	32.53	54.25	86.78	89.04	56.51
1950	30.39	33.95	46.92	80.87	80.80	46.85
1951	41.69	45.87	49.13	95.00	92.67	46.80
1952	47.11	50.56	50.62	101.18	104.45	53.89
1953	50.27	53.97	53.57	107.54	110.50	56.53
1954	57.12	61.56	51.38	112.94	109.61	48.05
1955	63.40	68.23	42.27	110.50	109.72	41.49
1956	66.36	71.69	40.18	111.87	112.90	41.21

—(Ray & Ray Compilation)



Steadily growing passenger loads carried by the local service airlines are shown in this graphic chart. It depicts the average revenue passenger load per year for all local carriers, the cabin shown being a 21-seat DC-3 configuration for illustration purposes.
—(FLIGHT MAGAZINE Chart.)

cause it would give them an opportunity to make money and remove them from the more onerous forms of Federal control. The only quick way to less subsidy would be to change the local service concept and make the carriers into regional trunk carriers with lots of non-stops between larger traffic generating centers, possibly allowing them to drop service to many of their intermediate towns. And if they went into competition with the trunks, it is still doubtful that they could even then go on without some subsidy.

That certainly is not the answer. The local carriers *are now doing exactly what they should be doing*. The only need for another level of scheduled air transportation in this country is expanding services the locals are presently supplying. When a vitally needed service does not pay for itself, it has to be subsidized. We need these services just as we need many other things for which we spend tax money. And in these days of $70,000,000,000 budgets the little $25 million annual bill for local air service is certainly a mere pittance, a *bargain* we could not afford to turn down.

This "bill of goods" has not been sold to Congress. The continuing hope or promise to get off the dole in a couple of years is not the way to get support of the local service concept. When the government goes out to buy a B-52, they permit the manufacturer and the suppliers to make a profit. There is no reason for the government to deny the local carriers a profit. The same Congress that directed these carriers to be permanently certificated should certainly be open to conviction that they should be permitted to make a profit.

We do not by any means infer that the locals will never get up to the self-sustaining basis they strive so diligently for. But it has been over ten years now since local service became a reality and not one carrier is even close to breaking even. Several were closer to the break-even point a few years back than they are today, yet today they are doing a more efficient job, providing more service to more customers over more route miles. All of them can expect to take on additional local service towns in the future. The new batch of local service area investigation cases scheduled by the Board probably will call for at least another fifteen or twenty million dollars of subsidy authorizations. This contemplated action certainly is not moving in the direction of getting the locals off the dole. If they can not possibly get away from subsidy the least we can do is stop calling it subsidy. The word just doesn't fit any longer. An entirely new and more realistic concept is desperately needed. Nearly everybody agrees the service is vitally necessary to the nation. The government created it and contracted for it. Phony formulas have been experimented with long enough. There are some indications the Civil Aeronautics Board is about ready to take the time and the trouble to get on with the job so long neglected.

In any study of the local service carriers as an industry there is a strong temptation to generalize. People lose sight of the fact that there are as many variations as there are similarities in the thirteen operations. Routes and geography and weather and population, travel habits, market potential, economic conditions and even concepts and ambitions differ considerably. Every one of the carriers has some of the same problems but all of them have different and difficult problems of varying intensity.

Equipment requirements are a case in point. The carriers have been sorely handicapped by the lack of a true local service airplane. It would be nice

(Continued on page 68)

Local Service Airlines Selected Route Pattern Data As of December 1956

Carrier	Population Served (1956) (000)	Number of Cities Served Total	Exclusive Local Service	% of Total Exclusive	Route Miles	Average Segment Length
Allegheny	18,459.2	47	21	44.7	2,243	62.3
Bonanza	3,224.9	17	11	64.7	1,422	88.9
Central	4,527.1	32	15	46.9	3,299	89.2
Frontier	1,565.9	47	36	76.6	3,516	81.8
Lake Central	8,452.0	28	16	57.1	1,454	55.9
Mohawk	13,735.9	28	8	28.6	1,793	74.7
North Central	8,738.1	42	32	76.2	2,709	66.1
Ozark	9,060.2	46	21	45.7	3,265	75.9
Piedmont	4,711.0	50	15	30.0	2,823	72.4
Southern	3,536.3	30	11	36.7	1,932	69.0
Southwest	4,304.6	29	18	62.1	1,500	60.0
Trans-Texas	4,715.4	52	30	57.7	3,819	77.9
West Coast	1,781.9	43	30	69.8	2,342	65.1
Total (unduplicated)	54,012.6	452	261	57.7	31,740	72.5

—(Ray & Ray Compilation)

Local Service For Liberal

By MERLE GODDARD

EDITOR'S NOTE: The people of Liberal, Kansas, set out on their own to bring airline service to their city. Merle Goddard, secretary-manager of the Liberal Chamber of Commerce, headed the whirlwind drive that brought Central Airlines to Liberal in December, 1956, just one year from the time that Liberal started its campaign. How Liberal became the catalytic agent for award of nearly 800 route miles, what they are doing to get the service off to a good start, and how they will continue efforts to not only retain, but increase, the volume of service, is set forth here as an interesting guidepost to the hundreds of cities of the country that are about to engage in CAB Area Investigation Cases as the Board and the local service airlines expand the local service system over the next few years.

WHEN it comes right down to the meat in the coconut, the most important single element in a city's presentation of a case to the Civil Aeronautics Board is to have a real, honest need for airline service by enough people to make the proposition interesting to the CAB and to the airlines. Everything else centers around this one point.

Liberal is 200 miles from anywhere, and not much lies in between. Our citizens had known for many years that our economy was growing despite completely inadequate surface transportation. Early in December, 1955, we took stock of our situation. We had petitioned Trans World and Braniff, for both of these big airlines fly over Liberal daily. Both were polite, but obviously uninterested in a virtually unknown town of 10,000 people. We then contacted the other airlines serving points in our general area (the closest point was nearly 100 miles away). This time we hit paydirt. Central Airlines' Keith Kahle made a trip all the way from Fort Worth to meet with us. We gave him the $20 grand tour complete with red carpet. When the whirlwind day ended, he told us he was impressed and that he figured we might have a chance with the CAB if we could just make them realize our true need for air service. Kahle gave us an outline of the type of material we should put into applications and exhibits, plus some pointers on what ideas other cities had used to good advantage. I'm sure that he left us with the thought he probably wouldn't hear any more about it.

We called a meeting of the directors of our Chamber the very next day, and we invited our friends from Guymon, Oklahoma, 40 miles down the road, to join with us in a joint effort to get service into both cities. We figured, and it looks as though we were right, that several cities working together can get more proof of potential traffic for a route that would serve them all, than any one city could offer if it chose to ignore the welfare of its neighbors and tried to hog the whole thing. All told, nine other cities came into the act in support of the route pattern as we proposed it, and all ten of us were awarded the new service. Cooperation pays off.

Liberal (left) has large airport in western Kansas. Key witness at Liberal hearing was Oilman Bill Beardsley.

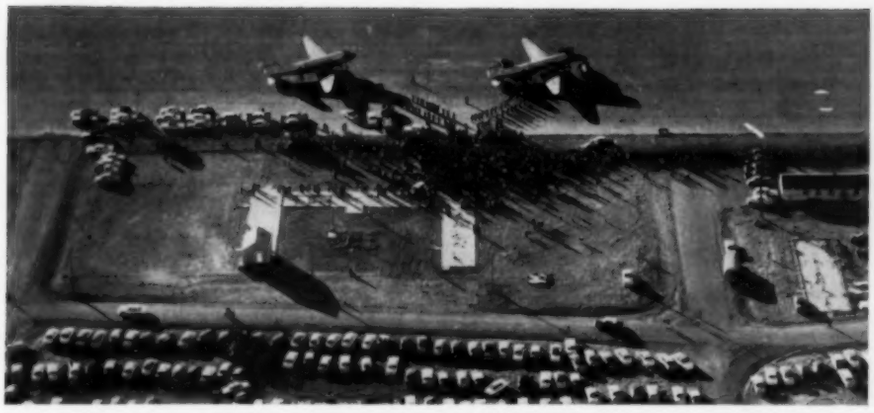
Figuring that this was the type of effort which could best be accomplished by a concerted drive with a minimum of opportunity for key people to drift into other efforts, we gave ourselves just 180 hours as a deadline to mail our applications and exhibits to the CAB.

The very first day we drew up a questionnaire for a potential air travel survey. This was mimeographed, circulated in person by our directors, and the end result—over 200 completed replies—were being tabulated before the day ended. Outstanding men in the fields of petroleum, agriculture, and general business were assigned these subjects, each assembled as sections of our exhibit. We put out a call for letters from people who had a genuine need for airline service from our city. This appeal was carried in the paper and on the radio as well as by phone and personal solicitation. Our leading businessmen phoned and wired their out-of-town suppliers who were faced with the problem of getting salesmen and service personnel into Liberal. The letters literally poured in.

We made the 180-hour deadline by squeezing 1,500 man hours into the period. Some of our top businessmen worked with us until two or three in the morning, and two of them right straight through one hectic night of printing the 262-page exhibit. Housewives joined in the tabulation of some 44,000 hotel registrations.

Because of the excellent cooperation of our members, the total out-of-pocket expense of our whole case was only about $2,400. The value of the man hours put into the thing, plus the self-paid expenses of the 135 or more people who were actively engaged in preparation of the exhibit, attendance at the hearings, writing of the briefs, and the final trip to Washington for oral argument was easily worth ten times the actual cost.

Three-foot stack of exhibits is viewed by Liberal leaders L. M. Bushart, Merle Goddard and Rod Leete.



First airliners serving Liberal were welcomed by large crowds. Central Airlines was extended free use of the airport for five years as Liberal's contribution toward reducing local air service subsidy burden.

We are sincere about our need for the service, and equally sincere about wanting to limit the burden of subsidy required to provide the service for us. We have offered Central Airlines the use of our airport and a new terminal building, now being built, rent-free for five years. Our newspaper and our radio station have each offered the airline a thousand dollars worth of free advertising.

We keep a monthly check on how we're doing on boarding passengers, and this is publicized to our citizens who are told that the service must be utilized if it is to remain with us. The first few months of operation, beginning December 3, were plagued with blizzards, tornados, dust storms, and blinding rains. Despite these handicaps, the first four months of operations bear out the forecasts of traffic that we made to a remarkably high degree. As a result of our potential air travel survey, we estimated that 54% of our traffic would be to or beyond Wichita. Actual figures show it to be 53%. To Oklahoma City and beyond our estimates were 21%, with 18% being realized in experience thus far. Denver, to which we have never had a usable common carrier service, has proven most surprisingly that a latent market was really there. Our survey showed only 12% of our potential traffic moving in that direction while experience to date has proven it to be 23%. We believe that a careful survey, such as ours, offers the CAB its best guide.

We found that the aid and support of our state government through its Kansas Industrial Development Commission was of considerable benefit in carrying our case to the CAB on a higher level than from our own city. State Aviation Director Keith Isham was an effective witness in our behalf, and the Commission's director, John Sticher, appeared before the CAB in oral argument as the personal representative of the governor. Our U. S. senators, Andrew Schoeppel and Frank Carlson, in cooperation with Congressman Clifford Hope, were of great value in helping to keep the CAB aware that our needs required early action, and in turn kept us posted on the steps being taken by the CAB. All three represented us at oral argument in Washington.

The CAB was attentive to us, and granted us our desires. We intend to prove that their opinion of and confidence in Liberal shall be justified in the fullest. We will not rest on our laurels, but will earnestly labor to justify the confidence and cooperation given us by both the CAB and Central Airlines—by the only measuring stick that works—patronage! ★★★

The Effect on Passenger Generation of Substituting Locals for Trunk Airlines

City[1]	Quarter and Year of Substitution	Carriers	Trunks' Last Year	Number of Enplaned Passengers Locals' 1st Year	Increase Number	Increase Percent
Battle Creek-Kalamazoo	2/55	AAL/NOR	7,290	24,856	17,566	241.0
Clinton	1/55	BNF/OZA	677	1,353	676	99.9
Dubuque[2]	3/55	BNF/OZA	2,934	3,427	493	16.8
El Centro	3/52	WAL/BAL	4,177	5,876	1,699	40.7
El Dorado	2/53	DAL/TTA	2,117	3,583	1,466	69.3
Erie	2/53	AAL/AAA	4,221	9,512	5,291	125.4
Ft. Dodge[2]	3/55	BNF/OZA	2,316	2,064	(252)	(10.9)
Hickory	3/52	CAP/PAI	1,134	2,196	1,062	93.7
Jackson	2/55	AAL/NOR	1,140	4,218	3,078	270.0
Joplin	4/54	BNF/CEN	5,044	4,353	(691)	(13.7)
La Crosse	3/52	NWA/NOR	1,619	2,797	1,178	72.8
Laredo	4/55	BNF/TTA	3,347	4,808	1,461	43.7
Longview	3/53	BNF/TTA	1,724	4,005	2,281	132.3
Mansfield	2/53	TWA/LCA	2,961	4,444	1,483	50.1
Marion	2/53	TWA/LCA	1,291	1,878	587	45.5
Mason City[2]	3/55	BNF/OZA	3,589	2,682	(907)	(25.3)
Miles City	3/54	NWA/FAL	1,046	1,274	228	21.8
Pine Bluff	2/53	DAL/TTA	485	1,686	1,201	247.6
Prescott	4/49	TWA/FAL	1,109	2,839	1,730	156.0
Richmond	4/50	TWA/LCA	1,196	1,177	(19)	(1.6)
South Bend	2/55	AAL/NOR	4,161	13,539	9,378	225.4
Terre Haute	4/54	DAL/LCA	2,045	4,932	2,887	141.2
Texarkana	2/53	AAL/TTA	4,881	3,593	(1,298)	(26.6)
Wenatchee	3/53	NWA/WCA	2,434	3,610	1,176	48.3
White Plains	1/55	AAL/MOH	2,599	2,981	382	14.7
Worcester	3/53	TWA/MOH	631	2,594	1,963	311.1
Yuma	3/52	WAL/BAL	2,475	5,012	2,537	102.5
Zanesville	2/53	TWA/LCA	1,426	1,437	11	0.8
Totals			70,069	126,716	56,647	
Average			2,502	4,525	2,023	80.8

[1]All Cities Having Local Service for at Least a Year After Substitution.
[2]Braniff's Route 106 Operation.

(Ray & Ray Compilation)

The Effect on Passenger Generation of Suspending a Trunk Airline at a Point Served by Both a Trunk and a Local Carrier

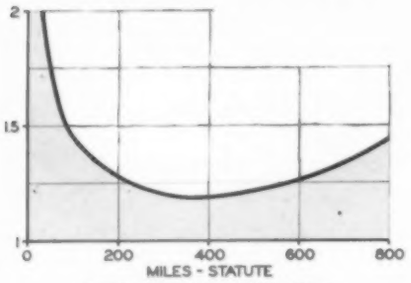
City[1]	Quarter and Year of Suspension	Carriers	Last Year Both Lines	Number of Enplaned Passengers 1st Year Local Only	Increase Number	Increase Percent
Abilene	4/50	AAL/PAL	10,626	11,081	455	4.3
Big Spring	4/50	AAL/PAL	3,180	2,746	(434)	(13.7)
Bradford	3/54	UAL/AAA	12,529	16,528	3,999	31.9
Bristol[2]	3/52	AAL/PAI	27,165	29,416	2,251	8.3
Duluth	1/51	NWA/NOR	4,552	9,693	5,141	112.9
Eau Claire	1/52	NWA/NOR	1,489	1,504	15	1.0
Elmira	3/55	AAL/MOH	19,763	19,275	(488)	(2.5)
Eureka	3/52	UAL/SWA	17,524	18,157	633	3.6
Galveston	2/54	BNF/TTA	3,071	712	(2,359)	(76.8)
Kokomo	4/50	DAL/LCA	835	1,596	761	91.1
Lancaster	2/53	TWA/AAA	3,363	2,940	(423)	(12.6)
Lynchburg	3/52	AAL/PAI	6,246	5,907	(339)	(5.4)
McAlester	2/53	BNF/CEN	1,139	1,292	153	13.4
Monterey	3/52	UAL/SWA	14,041	17,935	3,894	27.7
Muskogee	4/54	BNF/CEN	3,038	2,302	(736)	(24.2)
Paris	1/53	BNF/CEN	543	776	233	42.9
Ponca City	3/54	BNF/CEN	2,979	3,191	212	7.1
Pueblo[2]	1/52	BNF/FAL	3,035	2,944	(91)	(3.0)
Quincy[2]	4/54	TWA/OZA	4,003	4,304	301	7.5
Red Bluff	3/52	UAL/SWA	1,568	1,025	(543)	(34.6)
Rockford	1/55	BNF/OZA	17,431	26,507	9,076	52.1
Rock Springs	3/52	UAL/FAL	2,109	1,960	(149)	7.1
Santa Barbara	3/52	UAL/SWA	8,857	9,441	584	6.6
Tyler[2]	3/53	BNF/TTA	4,391	6,645	2,254	51.3
Wilmington[2]	2/53	TWA/AAA	2,094	1,264	(830)	(39.6)
Winslow	2/53	TWA/FAL	4,072	3,160	(912)	(22.4)
Total			179,643	202,301	22,658	
Average			6,909	7,781	872	12.6

[1]All Cities Having Local Service for at Least a Year After Suspension of a Trunk.
[2]Cities Served by Another Trunk whose Traffic is Not Included.
SOURCE: Air Carriers' Forms 41.

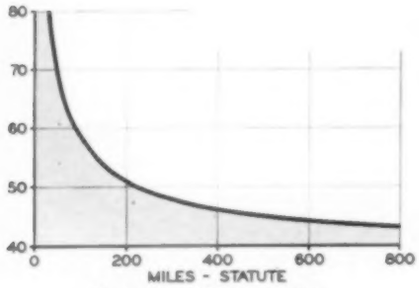
(Ray & Ray Compilation)

Better Equipment For Locals

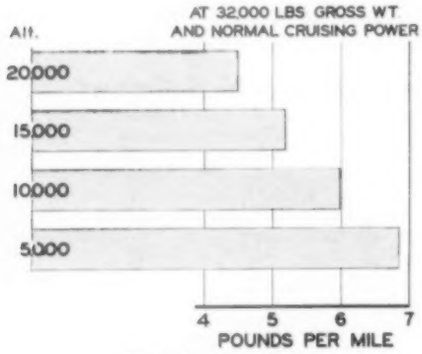
FAIRCHILD F-27 CHARTS



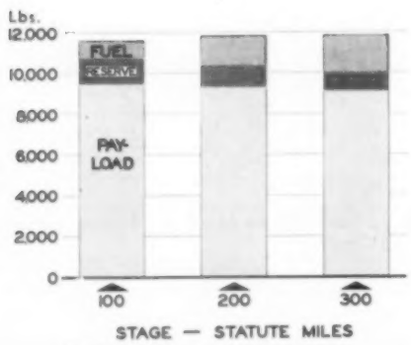
Available Seat Mile Cost
Direct Operating Cost in Cents



Cost Per Airplane Mile
Direct Operating Cost in Cents



Fuel Consumption



Fuel and Payload vs Distance

PROMISE of Fairchild F-27 propjet airliner deliveries early next year, impressive 10% DC-3 operating cost reductions with the use of drag-reduction modifications, and continued use of larger transports such as Martins and Convairs on some high-density segments are improving the equipment outlook for local airlines.

Five of the 13 locals have ordered 28 and have options for 17 more of the 280-mph., pressurized-cabin, air-conditioned, 40-passenger F-27 Friendships. R. James Pfeiffer, Fairchild's executive director of customer relations, told FLIGHT MAGAZINE on May 29 (1) he expects F-27 CAA certification within 90 days, (2) first F-27 will be delivered before January 1, (3) 25 or 30 F-27's will be delivered before June 1, 1958 and (4) the F-27 base price remains at $590,000.

The airline version, with two 1,600-shp. Rolls-Royce Darts, has an empty weight of 22,237 lbs. and a gross weight of 34,520 lbs. with 1,320-gal. fuel capacity. Economic claims for it are pictured in the accompanying charts and include direct operating costs of 51 cents per airplane mile and 1¼ cents per available seat mile at 200-mile range.

Fairchild's box score of F-27 orders on May 29 stood at 58 firm and 22 optional for a total of 80 planes. The breakdown, with options in parenthesis, is as follows:

Airlines: West Coast 6, Mackey 2, Piedmont 12 (12), Frontier 4 (2), Bonanza 3 (3), Quebecair 2, AREA 1 (1), Northern Consolidated 3, Airline X 5 (3), Airline Y 3, Wheeler 2 and Southwest 3. Executive Versions: Continental Can, General Tire, Butler Aviation and Banco de Mexico 12 (1).

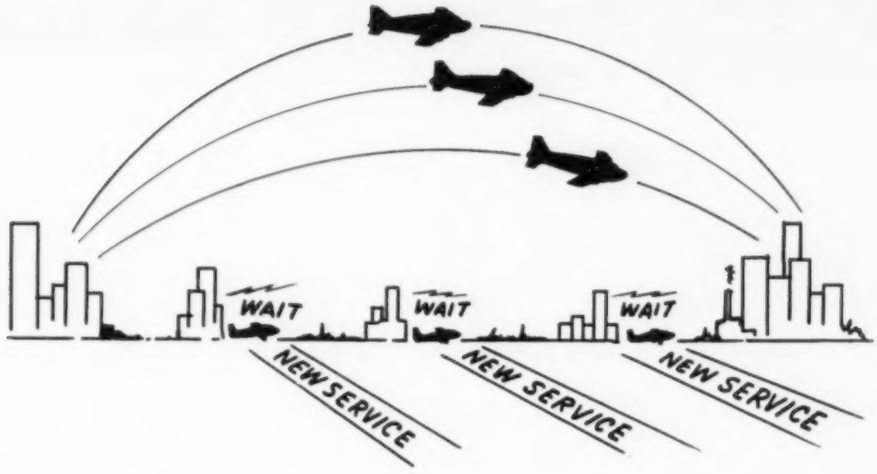
Meanwhile, until the F-27 begins operations, locals with DC-3's are attempting to off-set steadily rising operating costs with ingenious drag-reduction modifications, including improved nacelles, cylinder baffling, exhaust stacks, landing gear doors, tail wheel closures, wing fillets and aileron gap closures. A few of these are airline originations but most are available in kits, most prominent of which is the thoroughly-engineered Maximizer Kit offered by AiResearch Aviation Service, Los Angeles International Airport. This well-known firm guarantees a 20-mph. DC-3 cruising speed increase at no increase in power for its kit and by its formula can show figures, for a typical example, adding up to a reduction of 234.9 hrs. out of a 2,000-hr. operating period. Take-offs, climbs, cruise, let-downs and landings are figured. At $85 hourly operating cost, this amounts to $19,890 saved per airplane per 2,000-hr. year.

Two local carriers have used this modification kit and other variants in accomplishing DC-3 operating cost reductions—Ozark and Trans-Texas. The latter has not accumulated sufficient time to peg its savings definitely. But Ozark has. The Ozark experience, ironically, rules out savings from speed-up itself, but capitalizes on economy through power reduction. The speed approach was dropped when pilots countered with increased crew demands which offset the savings from faster schedules. Instead, Ozark's modified DC-3's obtain standard DC-3 performance with less power —about 50 to 75 hp. less for cruise, for example. Savings include 8-gals. per hr. less fuel, which translates into 80 lbs. or more additional payload for a 2 hr. hop, for example. In addition to fuel savings and payload increase, Ozark's power economy results in longer engine life, some 200 hrs. being added to the 1,200-hr. period between engine overhauls.

Both Ozark and Trans-Texas expect to save 10% from power reduction; this would save $14,500 per airplane for locals using 148 DC-3's last year; their total direct operating cost, excluding depreciation, topped $21,700,000.

AiResearch Maximizer Kit features can be seen in this photo of a modified DC-3. Note low-drag engine nose cowling, outlet for Siamese exhaust stacks, landing wheel doors, tail wheel closure. Unseen are new engine baffling and aileron gap closure. Due to drag reduction, 20-mph. cruising speed increase without additional power is guaranteed. If more speed is not desired, reduced power will cut fuel requirements, increase payload and lengthen engine overhaul life. Improved safety margins are also achieved.

Air Traffic Delays Burden Local Airlines



By LESLIE O. BARNES
President, Allegheny Airlines, Inc.

BIG CITY air traffic congestion now under study by numerous Federal and civil agencies has become an even bigger problem for the smaller communities located along the airways radiating from terminal traffic control centers. Under the present traffic control system, ill adapted to intermediate city requirements, weather conditions in a major terminal city are automatically reflected in the movement of all air traffic between cities in the entire region under the jurisdiction of the terminal control center. Air traffic attempting to move between cities located 150 to 200 miles away from a congested metropolitan traffic control center may find the "lid" on even though local flying weather is adequate.

Allegheny Airlines, located as it is in the densest airway web of the nation, finds the effect of this problem on air service between intermediate cities one of the knottiest and most costly problems in the hard road of the local service operator.

Allegheny's route Segment 7 between Cleveland and New York via Erie, Bradford, Williamsport and Wilkes-Barre/Scranton presents a typical situation. Under instrument conditions, Allegheny's flights must obtain ATC clearance for each of the three or four stops along this 426-mile segment. Each clearance is a potential 10, 15 or even 60-minute ATC delay. Unusually severe delays are experienced when changing over from the Cleveland Air Route Traffic Control Area to the New York Air Route Traffic Control Area between Bradford and Williamsport. This requires a coordinated "clearance" from both centers and under "tight" conditions at New York, Allegheny may wait 20 minutes or more simply trying to get a clearance request through to the Center, where personnel may be preoccupied with the immediate New York traffic problem. The hop from Bradford to Williamsport is approximately 100 miles and the flying weather may be more than adequate; nevertheless, flights between these points are subject to delays occasioned by congestion in the immediate New York area.

Twenty or 30 minutes, or even an hour ATC delay on a Chicago-New York or a coast-to-coast flight may be considered a minor inconvenience. A series of two or three cumulative 20, 30 or 60-minute delays on Allegheny, however, can be and frequently is serious for a number of reasons:

1. The passenger may miss his connecting flight at the terminal.

2. The average trip on Allegheny is about 90 minutes; when passengers are en route two to two and one-half times the scheduled flight time, they may be understandably upset and in many cases consider the trip a complete loss.

3. Other flights on which the aircraft is routed are late throughout the balance of the day.

The traffic control problem between intermediate cities is a result of control being exercised from distant points where there may be a preoccupation with congestion in the immediate vicinity of the terminal center and the fact that a substantially increased volume of traffic is being handled through limited airspace between intermediate cities with essentially the same facilities and procedures employed ten years ago.

The situation on the airways under present procedures might be compared with a turnpike on which all traffic for hundreds of miles is controlled by an agency at one of the terminal exits. All traffic entering or leaving the turnpike at intermediate intersections does so only by permission of the terminal authority. A traffic jam at the terminal would demand the attention of the controller and traffic out along the route would simply have to wait until he could get to it.

While Allegheny, because of its location in the Middle Atlantic Area, may be one of the first to experience the serious economic impact of the air traffic situation, it is a rapidly worsening disease striking at service to intermediate cities.

During the first quarter of 1957, Allegheny encountered over 936 hours of ATC ground and in-the-air delays on its system. This magnitude of accumulated delay represents the average utilization of 1.8 aircraft or approximately 10% of Allegheny's fleet of 20 Martin "Executives" and DC-3's. The estimated cost of the unproductive flying portion of these delays during the first quarter of the current year was $92,000 with at least $108,000 in potential passenger revenues lost in the same period for a total burden of $200,000.

The fact that Allegheny's passenger miles flown increased over 26% above last year does not contradict the effect of the delay situation. The increase should have been and no doubt would have been considerably higher under normal winter operating conditions.

While the experts are concentrating on the congested terminal area control problem and are emphasizing the needs of the coming Jet Age, relatively little attention has been given to the effect of terminal conditions on intermediate communities.

Under the Civil Aeronautics Board's local service program, many of these communities now have a great dependence on air transportation. Bradford, Pa., for example, a city of around 17,000, accounts for more than 50,000 passengers on Allegheny annually. There are no direct passenger rail services in Bradford. When air services are cancelled or substantially delayed over extended periods, particularly during

(Continued on page 78)

Ten Leading Cities Served by

IN PASSENGERS BOARDED (OF ALL CITIES SERVED):

	ALLEGHENY		BONANZA		CENTRAL		FRONTIER		LAKE CENTRAL		MOHAWK		NOR
1.	New York	61,696	Phoenix	31,911	Dallas	15,403	Denver	34,354	Chicago	21,696	New York	97,676	Chicago
2.	Pittsburgh	60,801	Las Vegas	22,201	Ft. Smith	12,768	Phoenix	16,657	Indianapolis	16,976	Binghamton	43,817	Milwaukee
3.	Scranton	27,304	Los Angeles	17,775	Kansas City	7,304	Salt Lake City	15,953	Columbus	15,054	Utica	39,983	Minneapolis
4.	Bradford	23,935	El Centro	10,274	Tulsa	7,008	Grand Jct.	14,009	Cleveland	8,731	Ithaca	30,105	Detroit
5.	Cleveland	22,035	Yuma	10,129	Ft. Worth	5,992	Albuquerque	11,906	South Bend	7,852	Buffalo	27,789	Madison
6.	Erie	21,764	Reno	8,107	Oklahoma City	5,992	Billings	9,847	Lafayette	7,593	Boston	20,886	Duluth
7.	Washington	20,579	Ontario	6,930	Joplin	5,132	Farmington	9,214	Mansfield	7,350	Elmira	20,493	Green Bay
8.	Harrisburg	19,249	San Diego	6,124	St. Louis	5,022	Flagstaff	7,287	Grand Rapids	5,647	Syracuse	14,568	Oshkosh
9.	Altantic City	17,937	Santa Ana	3,289	Fayetteville	4,991	Casper	6,747	Terre Haute	5,474	Albany	13,213	South Bend
10.	Williamsport	16,473	Indio	2,431	Little Rock	4,783	Durango	5,861	Youngstown	5,128	Rochester	12,734	Kalamazoo

IN PASSENGERS BOARDED (AT CITIES SERVED EXCLUSIVELY BY LOCAL SERVICE AIRLINES):

1.	Bradford	23,935	El Centro	10,274	Fayetteville	4,991	Farmington	9,214	Lafayette	7,593	Utica	39,983	Duluth
2.	Johnstown	8,789	Yuma	10,129	Ponca City	2,618	Flagstaff	7,287	Mansfield	7,350	Ithaca	30,105	Green Bay
3.	Jamestown	8,474	Ontario	6,930	Enid	2,614	Durango	5,861	Lima	4,910	White Plains	3,715	Oshkosh
4.	Altoona	7,709	Santa Ana	3,289	Borger	2,394	Riverton	4,138	Kokomo	2,869	Auburn	2,295	Battle Creek
5.	Philipsburg	6,655	Indio	2,431	Muskogee	1,929	Cortez	3,784	Marion, O.	1,948			Wausau
6.	Oil City	4,432	Kingman	1,581	Sherman	1,887	Winslow	3,310	Bloomington	1,823	No Others		Janesville
7.	Lancaster	4,028	Blythe	1,456	Duncan	1,697	Gallup	2,834	Dover	1,604	Served		Rhinelander
8.	Hagerstown	3,786	Hawthorne	508	Paris	1,232	Alamosa	2,822	Richmond	1,576	Exclusively		La Crosse
9.	Salisbury	3,598	Tonopah	456	Ardmore	978	Vernal	2,792	Zanesville	1,311			Stevens Pt.
10.	Cape May	1,934	Riverside	129	Stillwater	938	Laramie	2,569	Marion, Ind.	747			Jackson

IN AVERAGE NUMBER OF PASSENGERS BOARDED PER AIRCRAFT DEPARTURE:

1.	New York	14.92	Reno	10.99	Kansas City	10.15	Denver	14.44	Chicago	12.68	New York	20.67	Chicago
2.	Washington	12.14	Las Vegas	10.05	St. Louis	8.46	Phoenix	10.08	Cleveland	8.63	Poughkeepsie	17.53	Minneapolis
3.	Pittsburgh	11.51	Phoenix	9.99	Little Rock	7.54	Albuquerque	10.03	Youngstown	8.42	Boston	10.84	Milwaukee
4.	Cleveland	10.24	Las Angeles	7.33	Denver	6.17	Salt Lake City	9.74	Pittsburgh	8.15	Buffalo	9.72	Duluth
5.	Atlantic City	7.17	El Centro	5.31	Wichita	5.76	Billings	6.77	Columbus	8.01	Watertown	8.49	Madison
6.	Buffalo	7.07	Yuma	5.06	Dallas	4.52	Grand Jct.	5.77	Cincinnati	7.01	Binghamton	7.74	Detroit
7.	Huntington	7.00	Ontario	4.24	Oklahoma City	4.17	Casper	4.67	Grand Rapids	5.82	Ithaca	6.42	Kalamazoo
8.	Philadelphia	6.78	San Diego	3.13	Tulsa	3.98	Tucson	4.00	Indianapolis	5.28	Utica	5.63	South Bend
9.	Scranton	5.71	Burbank	2.15	Amarillo	3.70	Flagstaff	3.63	South Bend	4.03	Elmira	5.54	Int. Falls
10.	Erie	4.97	Riverside	1.87	Fort Smith	3.59	Durango	2.96	Terre Haute	3.97	White Plains	5.30	Battle Creek
					Joplin	3.59							

1956 Traffic Record of Cities Served by Local Service Airlines

(Ranked in Order by Number of Boarding Passengers; Compiled by FLIGHT MAGAZINE from CAB Records.)

NOTE: AL, Allegheny; BL, Bonanza; CN, Central; FL, Frontier; LC, Lake Central; MO, Mohawk; NO, North Central; OZ, Ozark; PI, Piedmont; SO, Southern; SW, Southwest; TT, Trans-Texas; WC, West Coast. Where more than one local airline is indicated as serving a city, the first carrier listed boarded the greatest number of passengers, the second listed boarded the second greatest number, etc. (1) Indicates city served exclusively by one or more local service airlines. (2) Indicates city where substantial traffic is exchanged with trunk airline (inter-line traffic). (3) Service provided on seasonal basis. (4) Data for less than complete year, service inaugurated during 1956. (5) Data for less than complete year, service suspended during 1956. (6) Major service pattern change during year, will reflect in substantial added traffic during 1957. (7) City named is one of two or more cities designated for service through joint airport. (8) New York City served through Newark Airport by local service airlines. (9) Tri-Cities, Tenn., are Bristol, Kingsport and Johnson City. (10) First full year of local airline service.

Rank 1956	Rank 1955	City and State	Carrier	Passengers Boarded 1956	Passengers Boarded 1955	Percent Change 1956/55	Passengers Boarded Per Departure
1	1	Chicago, Ill. (2)	NO, OZ, LC	287,053	222,213	29	14.91
2	2	New York, N. Y. (2, 8)	MO, AL	159,372	135,099	18	17.99
3	3	Milwaukee, Wis. (2)	NO, OZ	87,738	70,057	25	6.73
.....	.....	Dallas-Ft. Worth, Tex. (2)	TT, CN	71,289	47,127	51	4.28
.....	.....	San Francisco-Oakland, Cal. (2)	SW	70,582	66,359	6	7.82
.....	6	Los Angeles-Burbank, Cal. (2)	SW, BL	67,820	52,914	28	9.27
4	5	Pittsburgh, Pa. (2)	AL, LC	65,884	56,542	17	11.16
5	4	San Francisco, Cal. (2)	SW	64,572	58,707	10	10.47
6	.....	Los Angeles, Cal. (2)	SW, BL	59,440	.....	.....	11.28
7	9	Dallas, Texas (2)	TT, CN	56,658	36,178	57	6.03
8	7	Phoenix, Ariz. (2)	BL, FL	48,568	44,024	10	10.02
9	20	Washington, D. C. (2)	PI, AL	47,737	28,085	70	13.90
10	22	Binghamton, N. Y. (7)	MO	43,817	27,191	61	7.74
11	10	Cincinnati, O. (2)	PI, LC	43,081	35,506	21	12.43
12	11	Minneapolis-St. Paul, Minn. (2, 7)	NO	42,672	34,819	23	8.98
13	13	St. Louis, Mo. (2, 6)	OZ, CN	42,431	31,813	33	8.58
14	8	Tri-Cities, Tenn. (7, 9)	PI	42,349	37,724	12	5.89
15	14	Utica, N. Y. (1)	MO	39,983	31,569	27	5.63
16	15	Atlanta, Ga. (2)	SO	38,961	30,899	26	12.80
17	12	Roanoke, Va.	PI	36,625	33,516	9	4.87
18	18	Denver, Colo. (2, 6)	FL, CN	34,496	28,629	20	14.37
19	30	Buffalo, N. Y. (2, 6)	MO, AL	34,429	22,813	51	9.07
20	16	Seattle, Wash. (2)	WC	33,597	30,202	11	9.91
21	35	Detroit, Mich. (2, 6)	NO, AL, MO	31,913	21,270	50	5.62
22	23	Cleveland, O. (2)	AL, LC	30,766	27,075	14	9.73
23	25	Ithaca, N. Y. (1)	MO	30,105	25,246	19	6.42
24	21	Portland, Ore. (2)	WC	29,538	27,830	6	8.58
25	34	Rockford, Ill. (1)	OZ	28,194	21,649	30	6.77
26	27	Eureka, Cal. (1)	SW	28,145	24,747	14	10.98
27	24	Scranton, Pa. (2, 7)	AL	27,304	25,612	7	5.71
28	28	Memphis, Tenn. (2)	SO, TT	27,202	24,283	12	8.89
29	31	Madison, Wis.	NO	26,090	22,607	15	6.02
30	32	Louisville, Ky. (2)	PI, OZ	26,009	22,449	16	10.95
31	41	Peoria, Ill.	OZ	25,925	18,207	42	5.49
32	43	Houston, Tex. (2)	TT	24,965	18,011	39	8.74
33	55	South Bend, Ind.	NO, LC	24,086	13,811	74	4.67
34	45	Bradford, Pa. (1)	AL	23,935	17,732	35	3.85
35	33	Columbus, Ohio (2)	LC, PI	23,821	22,383	6	8.00
36	26	Charlotte, N. C. (2)	PI, SO	23,012	24,904	— 8	7.91
37	44	Erie, Pa. (6)	AL, MO	22,225	17,956	24	4.87

Local Service Traffic At 365 Stops

By E. H. PICKERING

THE one most outstanding feature of another year's analysis of local service airline statistics is the constant change which continues to take place in the traffic figures. Over-all traffic is up a whopping 21%, yet nearly a third — 102 of the 365 scheduled local airline stops —showed *decreases* in passenger boardings. Most of these decreases came in the figures of the points boarding lesser amounts of traffic —a probable result of management concentration of sales effort in the more lucrative markets.

The growth in the top traffic generating points is indicated by the accompanying tabulations, which show the traffic results of the leading 50 cities served by local airlines. In 1956, the boardings for the top 50 cities ranged from a high of over 287,000 passengers to a low of just over 20,000 passengers, as compared to 1955 boardings for the top 50 ranging from over

d by Each Local Service Airline

NORTH CENTRAL		OZARK		PIEDMONT		SOUTHERN		SOUTHWEST		TRANS-TEXAS		WEST COAST	
Chicago	177,395	Chicago	87,962	Tri-Cities	42,349	Atlanta	38,961	San Francisco	64,572	Dallas	41,255	Seattle	33,597
Milwaukee	83,210	St. Louis	37,409	Cincinnati	38,655	Memphis	20,152	Los Angeles	41,665	Houston	24,965	Portland	29,538
Minneapolis	42,672	Rockford	28,194	Roanoke	36,625	Monroe	11,047	Eureka	28,145	Beaumont	14,113	Boise	14,499
Detroit	31,206	Peoria	25,925	Washington	27,158	New Orleans	10,814	Monterey	21,093	San Antonio	14,106	Yakima	12,855
Madison	26,090	Springfield, Ill.	20,091	Richmond	21,378	Columbus, Ga.	10,069	San Jose	16,372	Tyler	9,429	North Bend	12,332
Duluth	20,850	Champaign	13,047	Charleston	19,970	Jackson	8,955	Sacramento	14,512	Shreveport	9,189	Pasco	10,941
Green Bay	20,098	Decatur	11,133	Charlotte	19,098	Greenville, Miss.	8,130	Santa Barbara	8,636	Ft. Worth	8,639	Spokane	9,166
Oshkosh	16,194	Paducah	8,862	Louisville	18,095	Jacksonville	7,001	Burbank	7,320	McAllen	8,457	Lewiston	9,086
South Bend	16,234	Moline	8,537	Norfolk	15,527	Baton Rouge	6,372	Medford	7,117	Corpus Christi	7,745	Walla Walla	8,005
Kalamazoo	16,022	Louisville	7,914	Fayetteville	14,219	Gulfport	6,137	Redding	6,678	Harlingen	7,521	Port Angeles	7,699

Duluth	20,850	Rockford	20,194	Fayetteville	14,219	Greenville, Miss.	8,130	Eureka	28,145	Tyler	9,429	North Bend	12,332
Green Bay	20,098	Champaign	13,047	Charlottesville	13,742	Columbus, Miss.	5,581	San Jose	16,372	McAllen	8,457	Pasco	10,941
Oshkosh	16,194	Decatur	11,133	Lynchburg	12,319	Tuscaloosa	5,010	Redding	6,678	Harlingen	7,521	Lewiston	9,086
Battle Creek	12,227	Columbia	5,502	Bluefield	7,989	Gadsden	4,722	Chico	5,802	Longview	6,928	Port Angeles	7,699
Wausau	9,874	Jefferson City	3,740	Kinston	3,644	Natchez	4,155	Crescent City	5,118	Laredo	4,808	Wenatchee	5,418
Janesville	7,013	Dubuque	3,482	Hickory	3,367	Tupelo	2,861	Oxnard	3,938	Texarkana	4,349	Pullman	4,551
Rhinelander	4,871	Bloomington	3,311	Beckley	3,081	Moultrie	2,816	Marysville	3,645	Victoria	4,298	Roseburg	4,132
La Crosse	1,739	Cape Girardeau	2,067	London	1,504	Vicksburg	2,691	Santa Maria	3,600	Pine Bluff	2,444	Ephrata	4,042
Stevens Pt.	1,727	Marion, Ill.	1,961	Myrtle Beach	1,366	Athens	2,457	Santa Rosa	3,284	Lufkin	2,209	Hoquiam	4,015
Jackson	1,365	Burlington	1,892	Southern Pines	980	Laurel	1,763	Paso Robles	3,188	El Dorado	2,047	Astoria	3,375

Chicago	15.27	Chicago	14.84	Washington	15.59	Atlanta	12.80	Los Angeles	14.63	Memphis	9.94	Port Angeles	11.13
Minneapolis	8.98	Louisville	9.42	Cincinnati	13.63	Memphis	8.57	Eureka	10.98	Houston	8.74	Boise	9.96
Milwaukee	6.70	Indianapolis	9.03	Louisville	11.79	New Orleans	7.90	San Francisco	10.47	Dallas	6.88	Seattle	9.91
Duluth	6.45	St. Louis	8.59	Columbus	9.70	Jacksonville	6.74	Medford	7.36	Beaumont	6.21	Portland	8.58
Madison	6.02	Milwaukee	7.10	Charlotte	8.45	Panama City	6.62	Monterey	7.27	McAllen	5.28	Idaho Falls	6.62
Detroit	5.59	Rockford	6.77	Norfolk	7.74	Monroe	6.44	Sacramento	4.98	Laredo	5.19	North Bend	6.09
Kalamazoo	5.41	Kansas City	6.06	Knoxville	6.93	Gulfport	6.03	Burbank	4.72	Lafayette	4.40	Medford	4.88
South Bend	5.05	Peoria	5.49	Tri-Cities	5.89	Charlotte	6.01	Redding	4.64	San Angelo	4.21	Spokane	4.67
Int. Falls	4.52	Paducah	4.64	Richmond	5.76	Jackson	5.37	Santa Barbara	4.13	Shreveport	3.68	Klamath Falls	4.65
Battle Creek	4.38	Nashville	4.54	Roanoke	4.87	Mobile	5.19	San Jose	4.04	San Antonio	3.36	Lewiston	3.86

—(FLIGHT MAGAZINE Compilation. Source: Airline Reports to Civil Aeronautics Board.)

222,000 to a low of just over 15,000.

During 1956, service was suspended at only 4 points (Auburn/Geneva, N. Y.; Asbury Park, N. J.; Watsonville, Calif., and Fort Bragg/Mendocino, Calif.) while service was being inaugurated at 16 points for a net increase of 12 points, bringing the 1956 total to 365 points that received service during the year. Because many of these points are designated by the CAB as "hyphenated stops" — points serving more than one city, such as Duluth/Superior and Bristol/Johnson City/Kingsport — the total number of cities served during 1956 was 458.

Other evidence of growth can be found in the table of the 50 leading cities in number of passengers boarded per aircraft departure. In 1956, these figures ranged from a high of 17.99 to a low of 6.21 as compared to 1955 figures ranging from 15.89 to 5.98. Along the same line, the number of passengers boarded at cities served exclusively by the locals ranged from a high of nearly 40,000 for the top city to nearly 4,900 for the 50th ranked city, as compared to 1955 figures of 31,000 for the top city and 4,600 for the 50th. Nine cities appear in the listing of the top 50 for the first time in 1956.

The 50 leading cities, in total, boarded 2,028,411 passengers in 1956 compared to 1,687,756 for the lead-

Rank 1956	Rank 1955	City and State	Carrier	Passengers Boarded 1956	Passengers Boarded 1955	Percent Change 1956/55	Passengers Boarded Per Departure
38	29	Las Vegas, Nev.	BL	22,202	23,070	— 4	10.05
39	17	Richmond, Va.	PI	21,378	29,454	—27	5.76
40	19	Monterey, Cal.	SW	21,093	28,059	—26	7.27
41	53	Boston, Mass. (2)	MO	20,886	14,202	47	10.84
42	46	Duluth, Minn. (1)	NO	20,850	17,620	18	6.45
43	54	Elmira, N. Y.	MO	20,493	13,900	47	5.54
44	47	Indianapolis, Ind. (2)	LC, OZ	20,153	17,339	16	5.65
45	37	Green Bay, Wis. (1)	NO	20,098	19,267	4	2.62
46	42	Springfield, Ill.	OZ	20,091	18,169	11	4.08
47	38	Huntington, W. Va. (2, 7	PI, AL	20,085	18,731	7	4.40
48	36	Charleston, W. Va.	PI	19,970	20,705	— 4	4.13
49	49	Harrisburg, Pa.	AL	19,249	15,633	23	4.37
50	65	Kalamazoo, Mich. (1)	NO, LC	19,166	11,351	69	3.95
51	52	Atlantic City, N. J.	AL	17,937	15,259	18	7.17
52	56	Oshkosh, Wis.	NO	16,494	13,694	20	3.72
53	48	Williamsport, Pa.	AL	16,473	16,047	3	4.96
54	82	San Jose, Cal. (1)	SW	16,372	9,281	76	4.04
55	57	Salt Lake City, Utah (2	FL	15,953	13,481	18	9.74
56	51	Norfolk, Va.	PI	15,527	15,301	1	7.74
57	68	Fort Worth, Tex. (2)	TT, CN	14,631	10,949	34	2.02
58	95	Syracuse, N. Y.	MO	14,568	8,328	75	4.25
59	61	Sacramento, Cal.	SW	14,512	13,045	11	4.98
60	63	Boise, Idaho (2)	WC	14,499	11,862	22	9.96
61	39	Medford, Ore. (2)	WC, SW	14,443	18,509	—22	5.85
62	50	Fayetteville, N. C. (1)	PI	14,219	15,434	— 8	4.51
63	69	Beaumont, Tex. (7)	TT	14,113	10,887	30	6.21
64	87	San Antonio, Tex. (2)	TT	14,106	8,794	60	3.36
65	74	Parkersburg, W. Va. (7)	AL, PI	14,096	9,975	41	3.48
66	67	Grand Junction, Colo.	FL	14,009	10,978	28	5.77
67	60	Lexington, Ky.	PI	13,864	13,062	6	3.17
68	191	Charlottesville, Va. (1, 10)	PI	13,742	3,469	296	3.79
69	72	Raleigh, N. C. (2, 7)	PI	13,580	10,661	27	4.43
70	70	Albany, N. Y.	MO	13,213	10,860	22	4.31
71	59	Champaign, Ill. (1)	OZ	13,047	13,297	— 2	3.97
72	66	Yakima, Wash.	WC	12,855	11,064	16	2.61
73	79	Fort Smith, Ark. (6)	CN	12,768	9,699	32	3.59
74	113	Rochester, N. Y.	MO	12,734	6,881	85	3.29
75	62	North Bend, Ore. (1)	WC	12,332	12,692	— 3	6.09
76	78	Lynchburg, Va. (1)	PI	12,319	9,780	26	2.19
77	114	Battle Creek, Mich. (1)	NO	12,227	6,768	81	4.38
78	84	Philadelphia, Pa. (2)	AL	12,086	11,584	4	6.78
79	81	Albuquerque, N. M. (2)	FL	11,906	9,353	27	10.03
80	73	Little Rock, Ark. (2)	TT, CN	11,252	10,620	6	4.22
81	71	Decatur, Ill. (1)	OZ	11,133	10,842	3	3.40
82	93	Monroe, La.	SO	11,047	8,450	31	6.44
83	77	Pasco, Wash. (1, 7)	WC	10,941	9,879	11	3.23
84	76	Kansas City, Mo. (2)	CN, OZ	10,921	9,885	10	8.29
85	89	New Orleans, La. (2)	SO	10,814	8,681	25	7.90
86	83	Grand Rapids, Mich. (2)	LC, NO	10,482	9,227	14	3.51
87	97	El Centro, Cal. (1)	BL	10,274	8,094	27	5.31
88	100	Yuma, Ariz. (1)	BL	10,129	7,948	27	5.06
89	84	Columbus, Ga.	SO	10,069	9,092	11	3.65
90	96	Wausau, Wis. (1)	NO	9,874	8,219	20	2.70
91	99	Billings, Mont. (2)	FL	9,847	8,036	23	6.77
92	91	Watertown, N. Y.	MO	9,707	8,538	14	8.49

(Continued on next page)

Passengers Boarded at Fifty Leading Cities Served Exclusively by Local Service Airlines, 1956

Rank 1956	Rank 1955	City and State	Revenue Passengers	Airline
1	1	Utica, N. Y.	39,983	Mohawk
2	3	Ithaca, N. Y.	30,105	Mohawk
3	5	Rockford, Ill.	28,194	Ozark
4	4	Eureka, Cal.	28,145	Southwest
5	8	Bradford, Pa.	23,935	Allegheny
6	9	Duluth, Minn.	20,850	North Central
7	6	Green Bay, Wisc.	20,098	North Central
8	15	Kalamazoo, Mich.	19,166	North Central
9	11	Oshkosh, Wisc.	16,494	North Central
10	20	San Jose, Cal.	16,372	Southwest
11	10	Fayetteville, N. C.	14,219	Piedmont
12	—	Charlottesville, Va.	13,742	Piedmont
13	13	Champaign, Ill.	13,047	Ozark
14	14	North Bend, Ore.	12,332	West Coast
15	18	Lynchburg, Va.	12,319	Piedmont
16	34	Battle Creek, Mich.	12,227	North Central
17	16	Decatur, Ill.	11,133	Ozark
18	17	Pasco, Wash.	10,941	West Coast
19	25	El Centro, Cal.	10,274	Bonanza
20	27	Yuma, Ariz.	10,129	Bonanza
21	24	Wausau, Wisc.	9,874	North Central
22	—	Tyler, Texas	9,429	Trans-Texas
23	29	Farmington, N. M.	9,214	Frontier
24	22	Lewiston, Wash.	9,086	West Coast
25	19	Johnstown, Pa.	8,789	Allegheny
26	33	McAllen, Texas	8,475	Trans-Texas
27	21	Jamestown, N. Y.	8,474	Allegheny
28	30	Greenville, Miss.	8,130	Southern
29	23	Bluefield, W. Va.	7,989	Piedmont
30	32	Altoona, Pa.	7,709	Allegheny
31	28	Port Angeles, Wash.	7,699	West Coast
32	37	Lafayette, Ind.	7,593	Lake Central
33	42	Harlingen, Texas	7,521	Trans-Texas
34	38	Mansfield, O.	7,350	Lake Central
35	35	Flagstaff, Ariz.	7,287	Frontier
36	41	Janesville, Wisc.	7,013	North Central
37	—	Ontario, Cal.	6,930	Bonanza
38	—	Longview, Texas	6,928	Trans-Texas
39	39	Redding, Cal.	6,678	Southwest
40	36	Philipsburg, Pa.	6,655	Allegheny
41	45	Durango, Colo.	5,861	Frontier
42	44	Chico, Cal.	5,802	Southwest
43	46	Columbus, Miss.	5,581	Southern
44	—	Columbia, Mo.	5,502	Ozark
45	47	Wenatchee, Wash.	5,418	West Coast
46	49	Crescent City, Cal.	5,118	Southwest
47	—	Tuscaloosa, Ala.	5,010	Southern
48	—	Fayetteville, Ark.	4,991	Central
49	—	Lima, Ohio	4,940	Lake Central
50	—	Rhinelander, Wisc.	4,871	North Central

Eliminated from the first fifty since 1955: Monterey and Santa Barbara, Calif., where United Air Lines service was re-instated by CAB order; Auburn, N. Y., where service was suspended in mid-year; Davenport, Iowa, where Ozark suspended operations at the Davenport airport to return operations at the Moline airport for joint service to the Quad-Cities, also served by United Air Lines and Braniff Airways; Oxnard, Calif., Jackson, Mich., Natchez, Miss., Prescott, Ariz., and Riverton, Wyo., were superseded by cities with faster growing traffic.

1956 Local Service Traffic Record of Cities

(Continued from preceding page)

Rank 1956	Rank 1955	City and State	Carrier	Passengers Boarded 1956	Passengers Boarded 1955	Percent Change 1956/55	Passengers Boarded Per Departure
93	103	Tyler, Tex. (1)	TT	9,429	7,656	23	2.17
94	106	Farmington, N. M. (1)	FL	9,214	7,582	22	2.65
95	129	Shreveport, La.	TT	9,189	5,760	60	3.68
96	92	Spokane, Wash. (2)	WC	9,166	8,458	8	4.68
97	86	Lewiston, Idaho (1, 7)	WC	9,086	8,839	3	3.86
98	88	Jackson, Miss.	SO	8,955	8,716	3	5.33
99	160	Paducah, Ky. (2)	OZ	8,862	4,326	105	4.64
100	80	Johnstown, Pa. (1)	AL	8,789	9,628	— 9	3.02
101	58	Santa Barbara, Cal.	SW	8,636	13,456	—36	4.13
102	98	Moline, Ill. (7)	OZ	8,537	8,087	6	4.31
103	85	Jamestown, N. Y. (1)	AL	8,474	9,050	— 6	2.92
104	111	McAllen, Tex. (1, 6, 7)	TT	8,457	7,201	18	5.28
105	....	Burbank, Cal.	SW, BL	8,380	.....	....	4.11
106	75	Knoxville, Tenn. (2)	PI	8,201	9,920	—17	6.96
107	108	Wilmington, N. C.	PI	8,162	7,557	8	4.45
108	107	Greenville, Miss. (1)	SO	8,130	7,575	7	2.99
109	119	Reno, Nev.	BL	8,107	6,348	28	10.99
110	125	Walla Walla, Wash.	WC	8,005	5,906	36	2.67
111	94	Bluefield, W. Va. (1, 7)	PI	7,989	8,415	— 5	2.47
112	105	Winston-Salem, N. C. (7)	PI	7,786	7,618	2	2.51
113	112	Corpus Christi, Tex.	TT	7,745	7,015	10	2.51
114	110	Altoona, Pa. (1)	AL	7,709	7,259	6	2.54
115	102	Port Angeles, Wash. (1)	WC	7,699	7,802	— 1	11.13
116	326	Poughkeepsie, N. Y. (10)	MO	7,694	606	1170	17.53
117	116	Joplin, Mo.	CN, OZ	7,676	6,510	18	2.95
118	121	Lafayette, Ind. (1)	LC	7,593	6,308	20	3.96
119	130	Harlingen, Tex. (1, 7)	TT	7,521	5,744	31	2.72
120	122	Mansfield, O. (1)	LC	7,350	6,289	17	2.44
121	115	Flagstaff, Ariz. (1)	FL	7,287	6,729	8	3.63
122	101	Greensboro, N. C. (7)	PI	7,166	7,836	— 9	2.13
123	127	Janesville, Wis. (1, 7)	NO	7,013	5,834	20	2.86
124	90	Tulsa, Okla. (2)	CN	7,008	8,596	—18	3.98
125	117	Jacksonville, Fla. (2)	SO	7,001	6,440	9	6.74
126	158	Ontario, Cal. (1)	BL	6,930	4,387	58	4.24
127	156	Longview, Tex. (1, 7)	TT	6,928	4,415	57	1.76
128	135	Hot Springs, Ark.	TT, CN	6,846	5,253	30	2.59
129	161	Casper, Wyo.	FL	6,747	4,316	56	4.67
130	124	Redding, Cal. (1)	SW	6,678	6,059	10	4.64
131	120	Philipsburg, Pa. (1, 7)	AL	6,655	6,318	5	3.24
132	118	Asheville, N. C. (7)	PI	6,621	6,380	4	4.57
133	....	Bakersfield, Cal. (4)	SW	6,482	.....	....	3.44
134	131	Baton Rouge, La.	SO	6,372	5,452	17	2.34
135	123	San Angelo, Tex.	TT	6,368	6,262	2	4.21
136	133	Gulfport, Miss. (7)	SO	6,137	5,339	15	6.03
137	180	San Diego, Cal.	BL	6,124	3,747	63	3.13
138	104	Oakland, Cal. (2)	SW	6,010	7,652	—21	2.10
139	146	Oklahoma City, Okla. (2)	CN	5,992	4,678	28	4.17
140	137	Durango, Colo. (1)	FL	5,861	5,171	13	2.96
141	134	Chico, Cal. (1)	SW	5,802	5,320	9	2.75
142	220	Austin, Tex.	TT	5,708	2,574	122	1.77
143	138	Columbus, Miss. (1)	SO	5,581	5,082	10	2.88
144	190	Columbia, Mo. (1)	OZ	5,502	3,470	59	2.71
145	143	Terre Haute, Ind.	LC	5,474	4,932	11	3.97
146	140	Wenatchee, Wash. (1)	WC	5,418	4,936	10	3.64
147	141	Pueblo, Colo.	FL	5,321	4,935	8	1.92
148	128	Birmingham, Ala. (2)	SO	5,248	5,805	—10	2.69
149	154	Youngstown, O. (2)	LC	5,128	4,454	15	8.42
150	145	Crescent City, Cal. (1)	SW	5,118	4,722	8	3.31
151	149	Tuscaloosa, Ala. (1)	SO	5,010	4,575	10	2.58
152	162	Fayetteville, Ark. (1, 6)	CN	4,991	4,305	16	1.72
153	139	Eugene, Ore.	WC	4,981	4,957	0	2.16
154	201	Lima, O. (1)	LC	4,940	3,110	59	3.26
155	185	Rhinelander, Wis. (1)	NO	4,871	3,588	36	2.85
156	144	Valdosta, Ga.	SO	4,814	4,892	— 2	2.39

(Continued on page 70)

ing 50 cities in 1955, a 20% gain.

The 50 leading cities served *exclusively*, in total, boarded 575,622 passengers in 1956 compared to 533,218 for 1955, an 8% gain.

The average number of passengers boarded *per departure* for the three-quarter-million-plus departures made by the locals during 1956 was 4.7 compared to 4.4 in 1955 and 3.8 in 1954.

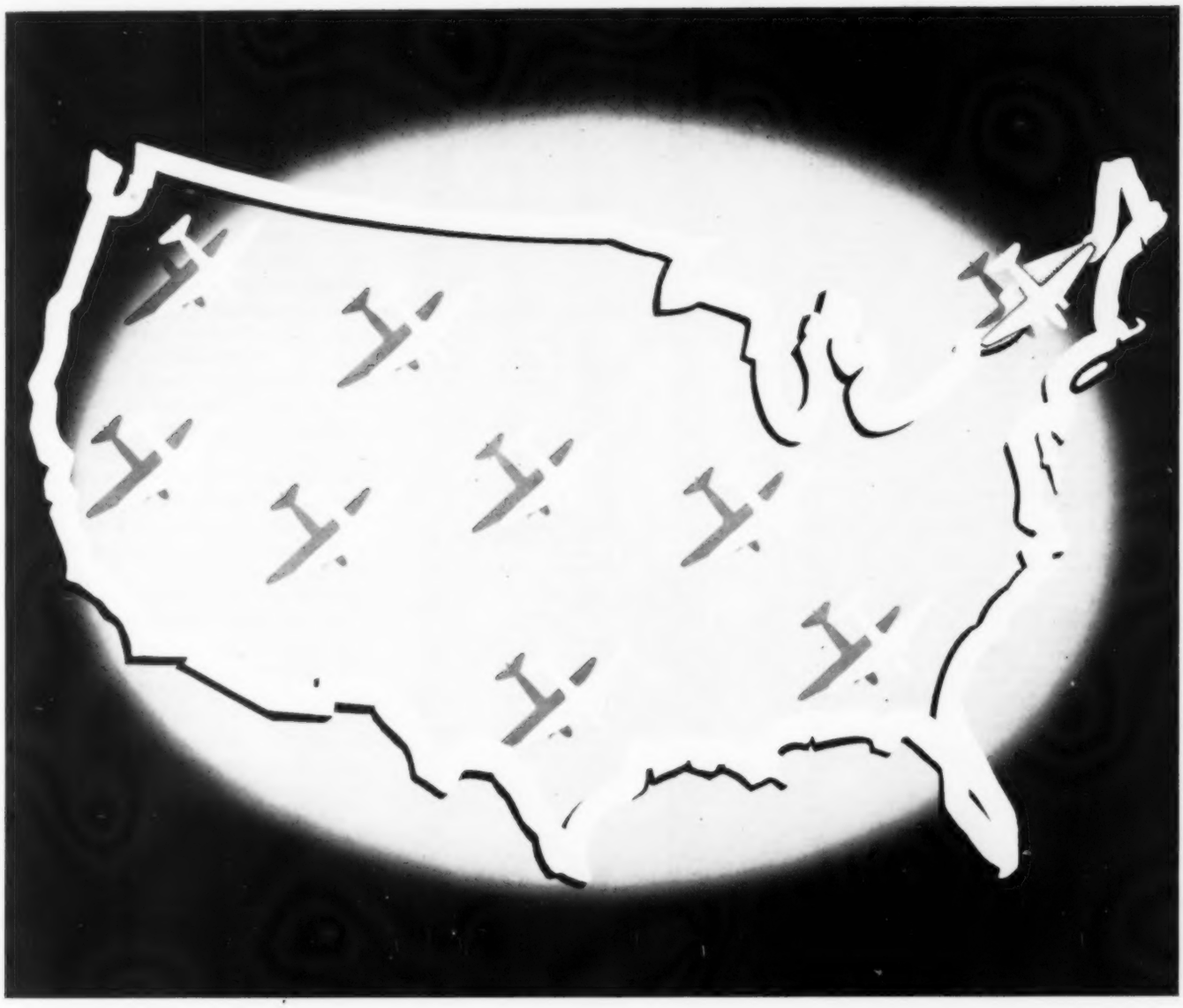
Outstanding increases in local service traffic during 1956 were made at Dallas, Washington, Binghamton, Buffalo, South Bend, Kalamazoo, San Jose, Syracuse, San Antonio, Charlottesville, Rochester (N. Y.), Battle Creek, Shreveport, Paducah, Poughkeepsie, Paso Robles, Dubuque, Twin Falls, Ontario, Longview, Casper, San Diego, Columbia, Mason City and Indio — all of which increased their passenger boardings by 50% or more in 1956 over 1955.

In 1955 the leading 10 cities in numbers of passengers boarded accounted for 25% of the total local service industry boardings. In 1956 this percentage was upped to 26%.

LOCAL AIR SERVICE, 1957

(Continued from page 61)

if *one* ideal airplane could fit every operator's routes, schedules and peculiar traffic situations. But no one design will fit all requirements. Today they either operate the old DC-3 or try to adapt a few Convairs or Martins to certain routes and schedules. One bright star on the horizon is the development of the Fairchild F-27 "Friendship" which many of the companies have on order and some of



In every section of the U.S.A. Local service airlines depend upon Shell

Today . . .

Nine out of the 13 leading local service airlines are users of Shell Aviation Fuel. The millions of miles flown by these lines contribute to the fact that:

More passengers, more air mail and more air freight fly on Shell Aviation Fuel than on any other brand.

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AEROSHELL 640 Kerosene will power new turbo-prop airliners, scheduled to begin local service operation in the fall.

SHELL OIL COMPANY

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1956 Local Service Traffic Record of Cities

(Continued from page 68)

Rank 1956	Rank 1955	City and State	Carrier	Passengers Boarded 1956	Passengers Boarded 1955	Percent Change 1956/55	Passengers Boarded Per Departure
157	176	Idaho Falls, Idaho	WC	4,810	3,802	27	6.62
158	352	Laredo, Tex. (1, 10)	TT	4,808	3	....	5.19
159	136	Lawton, Okla.	CN	4,766	5,186	— 8	3.38
160	166	La Crosse, Wis. (1)	NO	4,739	4,195	13	2.99
161	178	Stevens Point, Wis. (1, 7)	NO	4,727	3,789	25	1.60
162	151	Gadsden, Ala. (1)	SO	4,722	4,571	3	2.47
163	181	Worchester, Mass.	MO	4,631	3,688	26	2.22
164	184	Wheeling, W. Va.	AL	4,604	3,591	28	2.55
165	159	Pullman, Wash. (1, 7)	WC	4,551	4,352	5	3.04
166	163	Quincy, Ill. (7)	OZ	4,485	4,304	4	4.33
167	148	Oil City, Pa. (1, 7)	AL	4,432	4,591	— 3	2.86
168	172	Albany, Ga.	SO	4,376	3,941	11	2.17
169	126	Jackson, Mich. (1)	NO	4,368	5,847	—25	1.66
170	175	Texarkana, Ark.	TT	4,349	3,853	13	3.07
171	177	Eau Claire, Wis. (1)	NO	4,340	3,796	14	1.75
172	168	Victoria, Tex. (1)	TT	4,298	4,059	6	1.63
173	153	Wichita, Kan. (2)	CN, OZ	4,291	4,520	— 5	4.17
174	142	Prescott, Ariz. (1)	BL, FL	4,243	4,935	—14	1.23
175	187	Lansing, Mich.	NO	4,241	3,526	20	2.18
176	132	Natchez, Miss. (1)	SO	4,155	5,388	—13	1.70
177	147	Riverton, Wyo. (1, 7)	FL	4,138	4,652	—11	1.94
178	152	Roseburg, Ore. (1)	WC	4,132	4,527	— 8	2.21
179	189	Pocatello, Idaho	WC	4,121	3,479	18	2.84
180	167	Newport News, Va.	PI	4,108	4,063	1	1.61
181	202	Ephrata, Wash. (1, 7)	WC	4,042	3,101	30	2.70
182	195	Lancaster, Pa. (1)	AL	4,028	3,343	20	2.56
183	179	Hoquiam, Wash. (1, 7)	WC	4,015	3,772	6	3.73
184	182	Hibbing, Minn. (1, 7)	NO	3,950	3,642	8	2.51
185	169	Oxnard, Cal. (1)	SW	3,938	7,464	—47	2.75
186	173	Danville, Ill. (1)	LC, OZ	3,918	3,940	— 1	1.99
187	165	Cheyenne, Wyo.	FL	3,918	4,285	— 8	2.74
188	197	Escanaba, Mich. (1)	NO	3,811	3,238	18	3.40
189	171	Hagerstown, Md. (1)	AL	3,786	3,943	— 4	3.20
190	169	Cortez, Colo. (1)	FL	3,784	4,053	— 7	2.85
191	157	Jefferson City, Mo. (1)	OZ	3,740	4,404	—15	1.88
192	219	White Plains, N. Y. (1, 10)	MO	3,715	2,614	42	5.30
193	170	Marysville, Cal. (1)	SW	3,645	3,981	— 8	1.75
194	212	Kinston, N. C. (1)	PI	3,644	2,829	29	2.49
195	198	Springfield, Mo.	OZ	3,625	3,229	12	2.85
196	196	Marinette, Wis. (1, 7)	NO	3,600	3,273	10	1.97
197	199	Santa Maria, Cal. (1)	SW	3,600	3,161	14	2.36
198	194	Salisbury, Md. (1)	AL	3,578	3,353	7	3.60
199	208	Dubuque, Iowa (1, 10)	OZ	3,482	1,304	167	2.65
200	150	Mobile, Ala. (2)	SO	3,392	4,572	—26	5.19
201	188	Astoria, Ore. (1)	WC	3,375	3,497	— 3	3.10
202	217	Hickory, N. C. (1)	PI	3,367	2,659	27	1.64
203	193	Bloomington, Ill. (1, 10)	OZ	3,311	3,361	— 2	2.62
204	155	Winslow, Ariz. (1)	FL	3,310	4,428	—25	1.66
205	236	Twin Falls, Idaho	WC	3,302	2,146	54	2.35
206	210	International Falls, Minn. (1)	NO	3,294	2,854	15	4.52
207	223	Santa Ana, Cal. (1)	BL	3,289	2,439	35	1.85
208	164	Santa Rosa, Cal. (1)	SW	3,284	4,296	—24	2.32
209	233	Dayton, O.	LC	3,248	2,230	46	2.64
210	208	Klamath Falls, Ore.	WC	3,230	2,919	11	4.65
211	215	Marquette, Mich. (1)	NO	3,226	2,722	19	2.42
212	....	Lake Charles, La.	TT	3,200	....	....	2.68
213	231	New Bern, N. C.	PI	3,189	2,290	39	2.49
214	248	Paso Robles, Cal. (1, 7)	SW	3,188	1,760	81	2.39
215	207	Corvallis, Ore. (1, 7)	WC	3,166	2,923	8	1.43
216	241	Beckley, W. Va. (1)	PI	3,081	2,828	9	1.23
217	225	Nashville, Tenn. (2, 10)	OZ	3,081	2,418	27	4.54
218	200	Tucson, Ariz.	FL	2,912	3,159	— 8	4.00
219	209	Kokomo, Ind. (1)	LC	2,869	2,863	0	1.47
220	216	Tupelo, Miss. (1)	SO	2,861	2,717	5	1.52
221	228	Manitowoc, Wis. (1)	NO	2,836	2,305	23	1.88
222	204	Gallup, N. M. (1)	FL	2,834	3,039	— 7	2.00
223	203	Alamosa, Colo. (1)	FL	2,822	3,071	— 8	1.40
224	218	Moultrie, Ga. (1)	SO	2,816	2,615	8	1.41
225	206	Vernal, Utah (1)	FL	2,792	2,985	— 6	1.97
226	278	Mason City, Iowa (10)	OZ	2,792	1,124	148	2.13
227	250	Greenville, S. C.	SO	2,764	1,732	60	2.31
228	205	Vicksburg, Miss. (1)	SO	2,691	2,995	—10	1.65
229	232	Houghton, Mich. (1, 7)	NO	2,680	2,248	19	4.15
230	174	Bartlesville, Okla.	CN	2,670	3,934	—32	3.10
231	....	Lafayette, La.	TT	2,625	....	....	4.40
232	192	Ponca City, Okla. (1)	CN	2,618	3,438	—24	1.65
233	186	Enid, Okla. (1)	CN	2,614	3,581	—27	1.76
234	221	Laramie, Wyo. (1)	FL	2,569	2,573	0	1.83
235	224	Williston, N. D. (1)	FL	2,484	2,432	2	1.73
236	227	Rock Springs, Wyo. (1)	FL	2,482	2,335	6	1.73
237	234	Athens, Ga. (1)	SO	2,457	2,239	10	1.96
238	239	Pine Bluff, Ark. (1)	TT	2,444	2,066	18	.92
239	244	Montrose, Colo. (1)	FL	2,439	1,951	25	2.10
240	296	Indio, Calif. (1, 7, 10)	BL	2,431	930	161	1.76
241	213	Borger, Tex. (1)	CN	2,394	2,818	—15	3.09
242	226	Cody, Wyo. (1)	FL	2,345	2,375	— 1	2.93
243	....	Panama City, Fla. (4)	SO	2,325	....	....	6.62
244	40	Auburn, N. Y. (1, 5, 7)	MO	2,295	18,318	—87	2.77
245	222	Worland, Wyo. (1)	FL	2,294	2,475	— 7	1.59
246	238	Iron Mountain, Mich. (1)	NO	2,257	2,068	9	1.84
247	242	Lufkin, Tex. (1)	TT	2,209	1,995	11	1.46
248	183	Westfield, Mass. (7)	MO	2,197	3,615	—39	1.69
249	253	Cape Girardeau, Mo. (1)	OZ	2,067	1,699	22	1.57
250	243	El Dorado, Ark. (1)	TT	2,047	1,966	4	1.67
251	309	Fort Dodge, Iowa (10)	OZ	2,027	824	146	1.58
252	252	Marion, Ill. (1, 7)	OZ	1,961	1,699	15	1.56
253	267	Ukiah, Calif. (1)	SW	1,951	1,324	47	2.06
254	245	Marion, Ohio (1)	LC	1,948	1,937	1	.91
255	237	Cape May, N. J. (1, 3, 7)	AL	1,934	2,142	—10	3.10
256	230	Muskogee, Okla. (1)	CN	1,929	2,302	—16	1.01
257	272	Grand Forks, N. D.	NO	1,922	1,250	54	2.90
258	....	Burlington, Iowa (1, 4)	OZ	1,892	....	....	2.64
259	....	Sherman, Tex. (1, 4, 7)	CN	1,887	....	....	1.72
260	257	Ironwood, Mich. (1)	NO	1,853	1,627	14	1.54
261	254	Dover, Del. (1)	AL	1,829	1,677	9	2.48
262	247	Bloomington, Ind. (1)	LC	1,823	1,772	3	1.49
263	261	Clarksville, Tenn. (1, 7, 10)	OZ	1,792	1,363	31	1.35

(Continued on next page)

which should be in service during next year. CAB counsel recently issued some operating cost estimates on the F-27 during the Montana service case. The estimates ranged between 75 and 80 cents per mile. The average of the three carriers now using larger equipment is above 90 cents per mile. In the FLIGHT MAGAZINE study of the F-27 published in last year's Local Service Edition it was confidently predicted that this airplane would result in lower operating costs while building traffic at a more rapid rate. Nothing has transpired to change this expectation.

However, the carriers who have ordered F-27's are finding it difficult to finance them. Additional carriers would surely order the airplane if they could find the money. A number of carriers are opposed to the CAB's suggestion that a bill be put through Congress establishing a government-guaranteed loan plan. This bill has been introduced and might pass. Those who oppose the plan say it would put the government more in their business than it is now. Proponents say that as long as they are on subsidy the government is going to be running them anyway so they might as well guarantee the equipment loans to get better

Fifty Leading Cities Served by Local Service Airlines

(Ranked in Order by Passengers Boarded Per Departure)

Rank	City	Airlines	Psgrs. per Deptr.
1.	New York, N. Y.	MO-AL	17.99
2.	Pougkeepsie, N. Y.	MO	17.53
3.	Chicago, Ill.	NO-OZ-LC	14.91
4.	Denver, Colo.	FL-CN	14.37
5.	Washington, D. C.	PI-AL	13.90
6.	Atlanta, Ga.	SO	12.80
7.	Cincinnati, Ohio	PI-LC	12.43
8.	Los Angeles, Cal.	SW-BL	11.28
9.	Pittsburgh, Pa.	AL-LC	11.16
10.	Port Angeles, Wash.	WC	11.13*
11.	Reno, Nev.	BL	10.99
12.	Eureka, Cal.	SW	10.98*
13.	Louisville, Ky.	PI-OZ	10.95
14.	Boston, Mass.	MO	10.84
15.	San Francisco, Cal.	SW	10.47
16.	Las Vegas, Nev.	BL	10.05
17.	Albuquerque, N. M.	FL	10.03
18.	Phoenix, Ariz.	BN-FL	10.02
19.	Boise, Idaho	WC	9.96
20.	Seattle, Wash.	WC	9.91
21.	Salt Lake City, Utah	FL	9.74
22.	Cleveland, Ohio	AL-LC	9.73
23.	Buffalo, N. Y.	MO-AL	9.07
24.	Minneapolis-St. Paul, Minn.	NO	8.98
25.	Memphis, Tenn.	SO-TT	8.89
26.	Houston, Texas	TT	8.74
27.	Portland, Ore.	WC	8.58
28.	St. Louis, Mo.	OZ-CN	8.58
29.	Watertown, N. Y.	MO	8.49
30.	Youngstown, Ohio	LC	8.42
31.	Kansas City, Mo.	CN-OZ	8.29
32.	Columbus, Ohio	LC-PI	8.00
33.	Charlotte, N. C.	PI-SO	7.91
34.	New Orleans, La.	SO	7.90
35.	Binghamton, N. Y.	MO	7.74
36.	Norfolk, Va.	PI	7.74
37.	Monterey, Cal.	SW	7.27
38.	Atlantic City, N. J.	AL	7.17
39.	Knoxville, Tenn.	PI	6.96
40.	Philadelphia, Pa.	AL	6.78
41.	Billings, Mont.	FL	6.77
42.	Rockford, Ill.	OZ	6.77*
43.	Jacksonville, Fla.	SO	6.74
44.	Milwaukee, Wisc.	NO-OZ	6.73
45.	Idaho Falls, Idaho	WC	6.62
46.	Panama City, Fla.	SO	6.62
47.	Duluth, Minn.	NO	6.45
48.	Monroe, La.	SO	6.44
49.	Ithaca, N. Y.	MO	6.42*
50.	Beaumont, Tex.	TT	6.21

*Served exclusively by local service airlines.

airplanes which in turn will reduce the time required to get off the dole.

Meanwhile, the carriers are doing everything they can to improve their present equipment by constant modification. It is in this department that the amazing ingenuity of the locals shows up so brilliantly. The dividend here probably is most apparent in the virtually spotless safety record the local carriers have chalked up during nearly eleven years of development, coupled with greater dependability and increased efficiency in utilization during scheduled hours.

Let's not forget that the locals were originally called "feeders" and it was generally thought their main purpose was to "feed" into the trunks. With increases in numbers of strictly local passengers making their entire trips on the local lines, the "feeder" name had to be dropped. Actually, present traffic is both local and feeder and the percentage split of this traffic varies with the route circumstances of each carrier, some generating heavy local traffic, others going strong on interline business with trunks.

The growing attention to possible competition with trunks on certain route segments is justified. This traf-

Fifty Top-Ranking Pairs of Cities In Local Passenger Traffic Carried By Local Service Airlines

Monthly Averages[1]

Rank	Between	Local Service Airline	Passengers Carried by Local Service Airline 1956	1955
1.	Eureka-San Francisco	SW	2,914	1,655
2.	Ithaca-New York	MO	2,799	4,221
3.	Scranton-New York	AL	2,499	2,142
4.	Utica-New York	MO	2,283	2,157
5.	Binghamton-New York	MO	2,225	2,687
6.	Elmira-New York	MO	1,633	1,297
7.	Milwaukee-Chicago	NO	1,629	1,395
8.	Williamsport-N. Y.	AL	1,261	1,293
9.	Las Vegas-Phoenix	BL	1,186	1,317
10.	Duluth-Minneapolis	NO	1,069	741
11.	Yakima-Seattle	WC	1,052	589
12.	S. Jose-L. Angeles	SW	1,045	576
13.	Poughk'sie-B'hamton	MO	998	.....
14.	Casper-Denver	FL	970	.....
15.	Monterey-Los Angeles	SW	970	1,008
16.	Rockford-Chicago	OZ	829	.....
17.	Bradford-New York	AL	825	680
18.	Monroe-N. Orleans	SO	812	528
19.	Peoria-Chicago	OZ	860	493
20.	P. Angeles-Seattle	WC	795	882
21.	Roanoke-Richmond	PI	778	952
22.	Billings-Denver	FL	745	.....
23.	Madison-Chicago	NO	737	721
24.	Reno-Las Vegas	BL	696	615
25.	Norfolk-Richmond	PI	670	739
26.	Pasco-Seattle	WC	646	615
27.	Springfield-Chicago	OZ	626	493
28.	Peoria-St. Louis	OZ	616	489
29.	No. Bend-Portland	WC	616	747
30.	Erie-New York	AL	611	489
31.	Beaumont-Dallas	TT	588	589
32.	Huntington-Pittsb'gh	AL	585	454
33.	Decatur-Chicago	OZ	581	580
34.	Oshkosh-Chicago	NO	566	413
35.	Watertown-New York	MO	557	595
36.	Monterey-S. Francisco	SW	549	741
37.	Flagstaff-Phoenix	FL	525	702
38.	Champaign-Chicago	OZ	523	541
39.	Utica-Boston	MO	518	621
40.	Chico-S. Francisco	SW	495	.....
41.	Syracuse-New York	MO	492	.....
42.	San Angelo-Dallas	TT	488	.....
43.	Columbus-Cleveland	LC	486	519
44.	South Bend-Detroit	NO	486	.....
45.	Lafayette-Chicago	LC	482	.....
46.	South Bend-Chicago	NO	475	.....
47.	El Centro-Los Angeles	BL	473	495
48.	Crescent City-San Francisco	SW	467	.....
49.	Richmond-Washington	PI	467	.....
50.	Charlottesville-Washington	PI	464	.....

[1]Based on CAB March 1955-1956 Origination-Destination Airline Traffic Survey. Figures for two week survey periods annualized and then divided by 12. No entry in 1955 column indicates pairing was not among first 50 pairings in 1955.

1956 Local Service Traffic Record of Cities

(Continued from preceding page)

Rank 1956	Rank 1955	City and State	Carrier	Passengers Boarded 1956	1955	Percent Change 1956/55	Passengers Boarded Per Departure
264	240	Bismarck, N. D. (2, 7)	FL	1,774	2,053	—14	2.47
265	246	Laurel, Miss. (1)	SO	1,763	1,790	— 2	1.36
266	258	Bemidji, Minn. (1)	NO	1,714	1,568	9	1.40
267	235	Duncan, Okla. (1)	CN	1,697	2,189	—22	1.23
268	269	Greenwood, S. C. (1)	SO	1,677	1,285	31	1.35
269	340	Owensboro, Ky. (10)	OZ	1,655	358	362	1.19
270	.....	Des Moines, Iowa (2, 4)	OZ	1,609	.....	.....	4.41
271	262	Dover, Ohio (1, 7)	LC	1,604	1,362	18	1.07
272	280	Wilmington, Del. (1)	AL	1,602	1,120	43	1.24
273	332	Waterloo, Iowa (10)	OZ	1,582	527	200	1.17
274	259	Kingman, Ariz. (1)	BL	1,581	1,421	11	1.13
275	256	Richmond, Ind. (1)	LC	1,576	1,635	— 4	1.31
276	324	Sioux City, Iowa (10)	OZ	1,513	615	146	2.23
277	260	Brainerd, Minn. (1)	NO	1,512	1,377	10	1.30
278	255	London, Ky. (1, 7)	PI	1,504	1,655	— 9	1.27
279	273	Red Bluff, Calif. (1)	SW	1,483	1,224	21	1.17
280	241	Amarillo, Tex.	CN	1,479	2,051	—28	3.70
281	249	Glendive, Mont. (1)	FL	1,471	1,734	—15	1.08
282	285	Blythe, Calif. (1)	BL	1,456	1,033	41	1.09
283	277	Clintonville, Wis. (1)	NO	1,410	1,134	24	1.10
284	328	Silver City, N. M. (1, 6, 7)	FL	1,404	566	148	2.21
285	294	Trenton, N. J. (1, 10)	AL	1,382	939	47	1.21
286	265	Miles City, Mont. (1)	FL	1,376	1,329	4	.98
287	251	Myrtle Beach, S. C. (1, 3)	PI	1,366	1,699	—20	4.51
288	264	Brownwood, Tex. (1)	TT	1,335	1,342	— 1	.75
289	274	Clinton, Iowa (1, 10)	OZ	1,334	1,179	13	1.05
290	270	Zanesville, Ohio (1)	LC	1,311	1,285	2	1.13
291	229	Stockton, Calif.	SW	1,270	2,303	—45	1.28
292	291	Spartanburg, S. C.	SO	1,257	950	32	1.04
293	214	Coeur D'Alene, Idaho (1)	WC	1,249	2,794	—55	1.08
294	266	Paris, Tex. (1)	CN	1,232	1,326	— 7	.90
295	276	Mattoon, Ill. (1, 7)	OZ	1,214	1,158	5	1.29
296	323	Galveston, Tex. (1)	TT	1,200	617	94	1.17
297	.....	Dothan, Ala. (4)	SO	1,181	.....	.....	1.69
298	293	Winona, Minn. (1)	NO	1,166	941	24	.89
299	305	Gunnison, Colo. (1)	FL	1,160	867	34	1.06
300	.....	Ottumwa, Iowa (1, 4)	OZ	1,111	.....	.....	1.55
301	303	Pendleton, Ore.	WC	1,075	895	20	1.52
302	286	Yreka, Calif. (1)	SW	1,069	1,032	4	1.60
303	263	Olympia, Wash. (1)	WC	1,013	1,360	—26	1.05
304	282	Southern Pines, N. C. (1, 3, 7)	PI	980	1,061	— 8	2.31
305	279	Ardmore, Okla. (1)	CN	978	1,120	—13	1.70
306	298	Burley, Idaho (1, 7)	WC	970	919	6	.67
307	295	Pittsburg, Kan. (1)	OZ	958	933	4	.85
308	271	El Paso, Tex. (2)	TT	947	1,266	—25	2.67
309	297	Stillwater, Okla. (1)	CN	938	924	2	1.41
310	289	Danville, Va. (1)	PI	931	965	— 4	1.50
311	306	Baltimore, Md.	AL	931	855	9	2.68
312	302	Kerrville, Tex. (1)	TT	903	900	0	.65
313	299	Cairo, Ill. (1)	OZ	888	916	— 3	.75
314	311	Thief River Falls, Minn. (1)	NO	875	786	11	.89
315	287	Camden, Ark. (1)	TT	874	1,000	—13	.71
316	.....	Glens Falls, N. Y. (4)	MO	840	.....	.....	2.23
317	275	Monte Vista, Colo. (1)	FL	821	1,173	—30	.73
318	331	Beeville, Tex. (1)	TT	817	540	51	.39
319	307	Lock Haven, Pa. (1)	AL	810	849	— 5	1.06
320	300	Keene, N. H.	MO	790	914	—14	1.38
321	281	Easton, Md. (1, 7)	AL	783	1,065	—26	1.35
322	283	Dickinson, N. D. (1)	FL	769	1,052	—27	.61
323	314	Ada, Okla. (1)	CN	755	741	2	1.36
324	.....	Marion, Ind. (1, 4)	LC	747	.....	.....	1.83
325	310	Magnolia, Ark. (1)	TT	736	806	— 9	.60
326	316	Safford, Ariz. (1)	FL	733	717	2	1.05
327	319	Ontario, Ore. (1, 7)	WC	726	655	11	1.04
328	284	Sidney, Mont. (1)	FL	714	1,047	—32	1.02
329	317	Pittsfield, Mass.	MO	706	684	3	1.24
330	312	Watsonville, Calif. (1, 5)	SW	694	768	—10	1.05
331	288	Wolf Point, Mont. (1)	FL	684	997	—31	1.05
332	292	Marfa, Tex. (1)	TT	664	945	—30	.93
333	.....	Waco, Tex. (4)	TT	664	.....	.....	1.55
334	308	College Station, Tex. (7)	TT	661	845	—22	.75
335	304	Powell, Wyo. (1)	FL	661	893	—26	1.11
336	325	Greybull, Wyo. (1)	FL	658	607	8	.96
337	333	Clifton, Ariz. (1, 6, 7)	FL	599	521	15	.90
338	318	Cumberland, Md. (1)	AL	596	664	—10	1.96
339	315	Chehalis, Wash. (1, 7)	WC	587	727	—19	.69
340	320	Land O'Lakes, Wisc. (1, 3)	NO	582	645	—10	1.95
341	330	Baker, Ore. (1)	WC	562	561	0	.81
342	329	Fort Stockton, Tex. (1)	TT	547	562	— 3	.77
343	322	Pecos, Tex. (1)	TT	546	620	—12	.77
344	334	LaGrande, Ore. (1)	WC	524	520	0	.86
345	335	Hawthorne, Nev. (1)	BL	508	511	0	.85
346	321	Ellensburg, Wash. (1)	WC	489	621	—21	.52
347	290	Asbury Park, N. J. (1, 5)	AL	485	961	—50	1.05
348	338	Tononah, Nev. (1)	BL	456	440	4	.67
349	336	Fort Bragg, Calif. (1, 5, 7)	SW	455	490	— 7	.84
350	.....	Temple, Tex. (4)	TT	450	.....	.....	1.05
351	343	Marshall, Tex. (1)	TT	438	321	36	.30
352	301	Rawlins, Wyo. (1)	FL	430	901	—52	.77
353	327	McAlester, Okla. (1)	CN	417	594	—30	.71
354	342	Morehead City, N. C. (1, 3, 7)	PI	396	335	18	4.60
355	337	Helena, Ark. (1, 7)	TT	359	479	—25	.47
356	344	Brady, Tex. (1)	TT	318	313	0	.42
357	313	Gary, Ind. (1)	LC	307	750	—59	.58
358	345	Woodward, Okla. (1)	CN	239	313	—24	.53
359	346	McCall, Idaho (1, 3)	WC	230	308	—25	1.31
360	.....	Liberal, Kans. (1, 4)	CN	205	.....	.....	2.33
361	347	Stuttgart, Ark. (1)	TT	202	232	—13	.26
362	341	Georgetown, Del. (1, 3, 7)	AL	194	357	—36	1.60
363	339	Coleman, Tex. (1)	TT	180	360	—50	.25
364	.....	Riverside, Calif. (1, 4)	BL	129	.....	.....	1.87
365	.....	Colorado Springs, Colo. (4)	CN	78	.....	.....	1.70

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fic is between major centers served jointly by locals and trunks. In part it is traffic that the trunks can't accommodate during peak periods and is usually for journeys under 250 miles. In part it is traffic that the flight departure time of the locals just happens to accommodate. The great majority of this "competitive" traffic would prefer the non-stop, pressurized flights of the trunks over the multi-stop, old-airplane flights of the locals. In any case this traffic has been a boon to the local carriers and the CAB; it is revenue that helps hold down the subsidy during route and service expansion.

The advent of the fast jets might mark the advent of the time when the trunks stop scheduling stops under 250 miles apart. The same economics that demand use of jets for longer-haul services are also rather demanding of a trading-in of piston powered airplanes to help finance the costly jets. There should be less reluctance on the part of the trunks to give up the short haul market as jets and turboprops take over.

Both Braniff and Continental have taken a leading position lately in efforts to suspend service at less lucrative stops as they act to eliminate their DC-3 operations. It must be remembered that where transfers are made of these non-lucrative stops to the locals there may be an accompanying increase in subsidy requirements.

With the upswing of all costs, more must be done to improve the locals than just giving them towns that the trunks don't want. Over a year ago Ozark was given authority to operate flights between terminal points scheduling a maximum of only two intermediate stops—once two daily round trips were scheduled to all intermediate points on the route segment. Such liberalization assures a minimum of service to all points on the route, provides a more attractive service for those cities capable of developing greater traffic volume with faster and more frequent schedules, and helps the locals attract a little bit more of the terminal-to-terminal traffic.

The rash of applications from the locals that has flooded the CAB in recent months is indicative of the fact that the locals feel their present position is untenable and that something must be done to improve their condition. In part these applications seek extensions into more lucrative markets and an easing of restrictions that keep them from grasping traffic development opportunities over their present systems. Recent CAB decisions reveal that the going will be a bit rough. On the one hand the CAB granted Mohawk non-stop rights between Syracuse and New York in direct competition with American, while on the other hand an initial decision favors Western Air Lines, a trunk, for a new non-stop route between Phoenix and Denver, two points between which Frontier, a local, presently offers (via six intermediate stops) the only one-carrier service. In this initial decision, Frontier was recommended for only a slackening of restrictions permitting them to operate between the same points with only two mandatory intermediate stops.

Each Board decision aimed at liberalizing local carrier operating rights balances carrier-strengthening against protection of the vested interests of the trunk airline, and provides for improved service for stronger traffic centers with assurance of adequate service for the weaker traffic centers. Thus the "Ozark Authority" demands at least two daily round trips for the weaker points before a speeded-up service can additionally be provided for the stronger points.

The "Ozark Authority," however, is only the first step toward the

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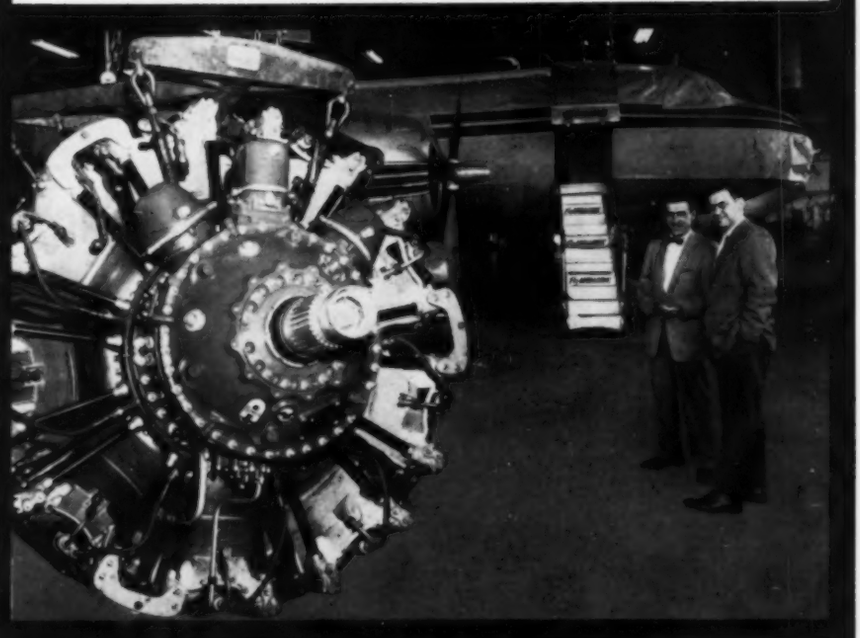

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strengthening of the locals and, to date, has only been applied to a few of the carriers.

Perhaps the next step in this 'liberalizing' effort could be the allowance of *complete* freedom in scheduling a third frequency between terminal points once the minimal two round trips are provided the intermediates, and from that point on a one-and-one pattern could be maintained, with the locals free to schedule non-stop or with any number and choice of intermediates in direct ratio to the frequency of service to all of the intermediates, and providing, further, that the 'free' scheduled flights will be operated with the same type of equipment as the mandatory flights serving the intermediates. Such freedom would still provide a safeguard for the trunks against unlimited competitive frequency by having competitive service tied directly to the amount of service provided the intermediates. It would safeguard the adequacy of service to the intermediates because traffic development at these points would be essential in order to gain additional 'free' scheduled flights.

This possibility, at least, has the advantage of being fairly simple of interpretation while having the necessary safeguards and assurances of ample efforts at developing traffic from the intermediate cities, which is primarily the reason the locals are in business. Proper application of the principles of this proposal could help many of the locals to ease their dependence on subsidy without serious adverse effects on the trunks, and would serve to encourage the trunks to concentrate efforts on the longer-haul jet and turboprop market toward which they seem to be inevitably aimed in any case.

LOCAL SERVICE AIRLINES
Comparison of Revenue Express and Freight Ton-Miles Flown
1955-1956

Carrier	1955	1956	% Increase
Allegheny	193,414	287,199	48.49
Bonanza	78,349	106,909	36.45
Central	76,875	97,414	26.72
Frontier	725,997	741,901	2.19
Lake Cent.	130,438	148,012	13.47
Mohawk	159,648	233,175	46.06
North Cent.	298,227	361,346	21.16
Ozark	162,240	281,093	73.26
Piedmont	284,234	297,961	4.83
Southern	133,941	155,411	16.03
Southwest	187,739	158,492	(15.58)
Trans-Texas	231,795	346,149	49.33
West Coast	99,533	90,799	(8.80)
Totals	2,762,430	3,305,841	19.67

LOCAL SERVICE AIRLINES
Comparison of Total Non-Mail Revenue (Cents Per Revenue Mile)
1955-1956

Carrier	1955	1956	% Increase
Allegheny	80.96	83.95	3.69
Bonanza	63.14	63.59	0.71
Central	35.88	45.34	26.37
Frontier	58.36	65.60	12.41
Lake Cent.	52.17	60.93	16.79
Mohawk	101.43	114.38	12.77
North Cent.	79.84	81.69	2.32
Ozark	59.39	62.68	5.54
Piedmont	72.00	74.34	3.25
Southern	53.97	59.05	9.41
Southwest	96.16	85.73	(10.85)
Trans-Texas	52.02	53.24	2.35
West Coast	58.44	60.72	3.90
Average	68.23	71.69	5.07

LOCAL SERVICE AIRLINES
Comparison of Total Operating Expense (Cents Per Revenue Ton-Mile)
1955-1956

Carrier	1955	1956	Decrease
Allegheny	102.22	104.92	(2.70)
Bonanza	102.21	101.88	0.33
Central	189.34	166.26	23.08
Frontier	102.37	92.14	10.23
Lake Cent.	149.90	130.51	19.39
Mohawk	85.19	93.31	(8.12)
North Cent.	94.88	90.09	4.79
Ozark	115.98	118.09	(2.11)
Piedmont	89.84	97.11	(7.27)
Southern	116.09	114.10	1.99
Southwest	77.35	87.21	(9.86)
Trans-Texas	121.11	112.34	8.77
West Coast	111.35	106.47	4.88
Average	103.36	102.81	0.55

LOCAL SERVICE AIRLINES
Number of Scheduled Aircraft 4th Quarters, 1955 and 1956

Carrier	1955	1956	Increase
Allegheny	18	20	2
Bonanza	8	9	1
Central	9	11	2
Frontier	12	13	1
Lake Cent.	8	10	2
Mohawk	13	13	0
North Cent.	18	21	3
Ozark	14	19	5
Piedmont	17	20	3
Southern	12	13	1
Southwest	11	13	2
Trans-Texas	16	18	2
West Coast	13	14	1
Totals	169	194	25

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There is some official and well-founded thinking that the Civil Aeronautics Board might spend more time on the basic financial policies affecting the locals. The Board has set up a proceeding to determine whether the locals have been able to realize a fair and reasonable return on their investment, under honest and economical management. The record, of course, shows that there has been no return on the investment; but the question is whether it's the carriers' fault or that of the government. It goes without saying that when the government starts investigating itself it tries to pin the blame on somebody else, so no one is getting steamed up over any happy returns from this investigation.

The Board has recently generated a lot of steam on hearings all over the country. The Seven States Area Case, covering the large white spot on the local airline map between the North Central and Frontier route systems, has been heard. It was a long one with over 100 cities being considered for first airline service or new service. If the Board grants anything like what seems to be in order, subsidy requirements will go up several million.

The Board has held hearings in the Pacific Northwest and Montana and a proceeding is now covering the Great Lakes area. Hearings are scheduled soon for the Northeastern section and the Piedmont area. Then farther down the line additional hearings will be held in the Southwest, the South-Central, the Central area and in the Far West.

Among the most interesting cases are those where one local seeks extensions deep into the territory of another local airline. It looks like a symptom of the "disease to do something", no matter what, to get out of the stalemate. This kind of proposal is symptomatic of the disease that grips the local carriers—a disease of insecurity that eventually will lead to desperation and futility unless the CAB stops looking upon this basic element of transportation as a stepchild.

For several years the thirteen locals have been working together in an organization known as the Conference of Local Service Air Lines. In recent months a serious rift developed that split the Conference in two and served to emphasize the disagreements among them. Characteristic of most people in aviation, the local airline presidents are rather individualistic and it is normal to expect wide variation of opinion. But the rift must not be permitted to last because the common good is far more important than any one or any group opinion on any facet of local service policy. There is little doubt but that an intelligent approach should soon be made toward

LOCAL SERVICE AIRLINES
Comparison of Revenue Miles Flown
1955-1956

Carrier	1955	1956	% Increase
Allegheny	4,734,904	5,460,875	15.33
Bonanza	2,342,576	2,870,214	22.52
Central	2,649,052	2,785,679	5.16
Frontier	4,864,092	5,421,167	11.45
Lake Cent.	2,206,844	2,365,966	7.21
Mohawk	3,547,569	4,178,448	17.78
North Cent.	6,414,950	7,900,015	23.15
Ozark	4,113,535	5,225,986	27.04
Piedmont	6,451,013	6,952,278	7.77
Southern	3,320,905	3,616,354	8.90
Southwest	3,316,457	4,048,797	22.08
Trans-Texas	4,379,912	6,056,996	38.29
West Coast	3,460,802	3,646,541	5.37
Totals	51,802,611	60,529,316	16.85

LOCAL SERVICE AIRLINES
Comparison of Revenue Passengers Carried

Carrier	1955	1956	% Increase
Allegheny	349,673	393,668	12.58
Bonanza	107,115	127,860	19.37
Central	94,282	107,758	14.29
Frontier	176,922	197,902	11.86
Lake Cent.	114,148	136,956	19.98
Mohawk	283,397	360,369	27.16
North Cent.	431,324	551,775	27.93
Ozark	247,031	318,994	29.13
Piedmont	362,233	405,153	11.85
Southern	170,589	191,080	12.01
Southwest	268,618	289,240	7.68
Trans-Texas	157,659	220,613	39.93
West Coast	200,945	214,874	6.93
Totals	2,963,936	3,516,242	18.63

LOCAL SERVICE AIRLINES
Comparison of Revenue Passenger Miles Flown
1955-1956

Carrier	(000) 1955	(000) 1956	% Increase
Allegheny	55,983	64,941	16.00
Bonanza	23,675	27,641	16.75
Central	15,518	19,760	27.34
Frontier	46,290	53,300	15.14
Lake Cent.	16,995	21,368	25.73
Mohawk	50,954	64,708	26.99
North Cent.	67,667	85,659	26.59
Ozark	37,617	49,013	30.29
Piedmont	70,043	77,136	10.13
Southern	28,845	33,752	17.01
Southwest	52,345	59,398	13.47
Trans-Texas	35,975	50,184	39.50
West Coast	35,110	38,134	8.61
Totals	537,017	644,994	20.11

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again banding together in common bond in those areas where unity of purpose is a must without affecting either their individuality or right to differ in opinions from time to time on all matters.

In summary, and without any intention or desire to criticize the Civil Aeronautics Board, which in many ways always has been benevolently paternalistic toward the locals, it is crystal clear that the thinly spread CAB staff working on local service matters and the Board members themselves have only a theoretical knowledge of the daily harassing problems faced by local service management and even to a lesser degree whether or not the needs of the smaller communities are being adequately met.

Permanent certification of the carriers last year certainly points to the fact that ultimate success is assured, but success can only come when an enlightened Civil Aeronautics Board will face up to the stark facts. First, that subsidies for enterprises necessary to public service to smaller cities fall in the same category as rural free delivery, soil conservation and national defense. Second, that while the subsidy is for the benefit of the public, not the carrier, an element of return on investment and labors is absolutely essential to maintain the best efforts of financial and managerial interests. Third, that subsidies to the locals will necessarily increase before over-all decreases can be anticipated. Fourth, the locals must have an expanded operating base in both quantity and quality of route systems with more freedom to achieve efficient and productive operations on their own hook. Such liberalization of routes and services coupled with the purchase of what is hoped to be more efficient aircraft will require increased "investments" through service payments on the part of the government but over the years will, as in the case of the now self-sufficient, profitable trunkline systems, start the downward trend. On the other hand, continuation of the program of "cutting the subsidy" and of "holding-the-line" offers small hope of subsidy elimination for many, many years. But, worst of all, adherence to the old policy toward local service air transportation, with its creeping parsimony, will defeat the very purposes of public service which the law of the land decrees must be provided. ★ ★ ★

LOCAL SERVICE AIRLINES
Comparison of Average Passenger Loads
1955-1956

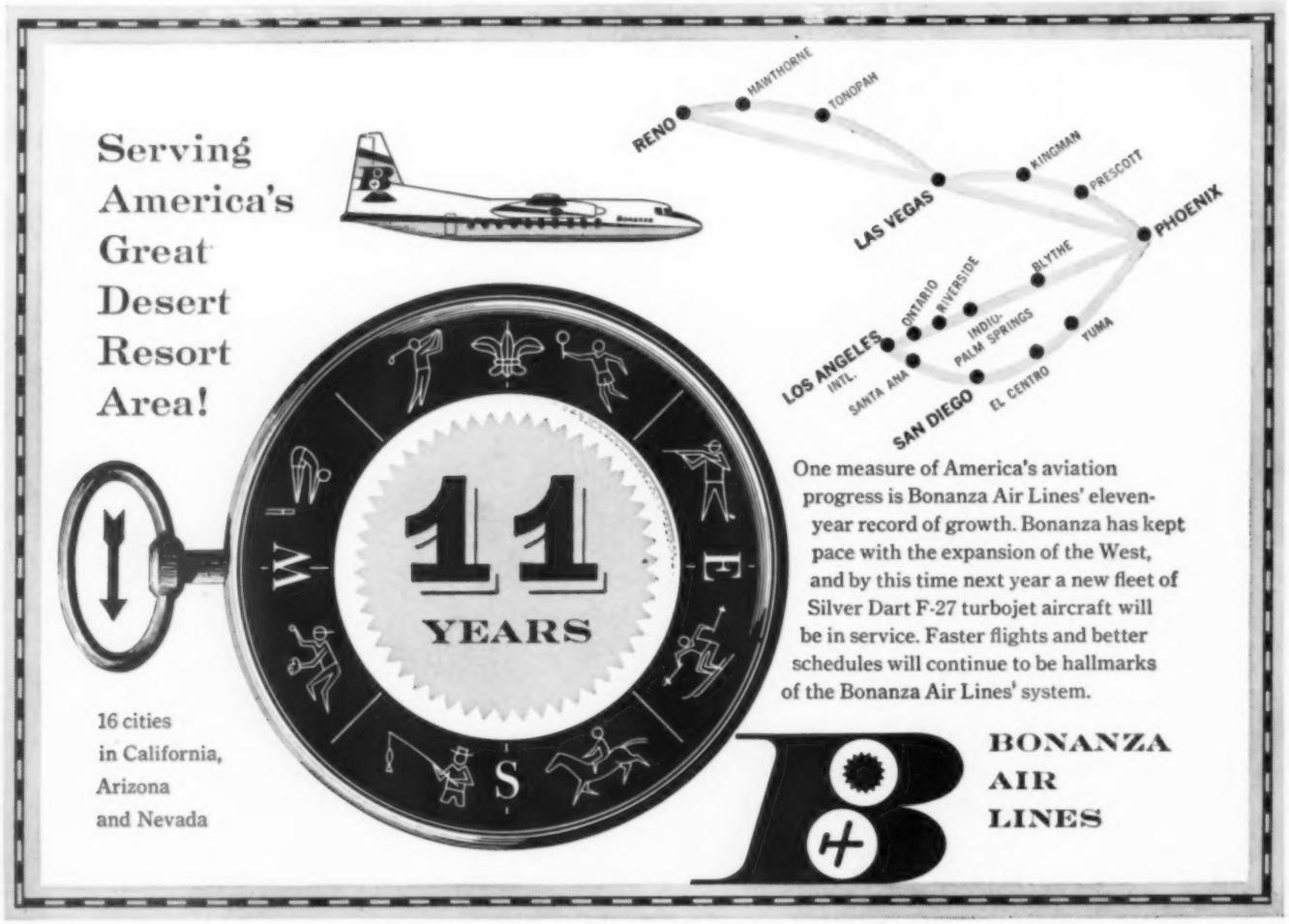
Carrier	1955	1956	Increase
Allegheny	11.82	11.89	0.07
Bonanza	10.11	9.63	(0.48)
Central	5.86	7.09	1.23
Frontier	9.52	9.83	0.31
Lake Cent.	7.70	9.03	1.33
Mohawk	14.36	15.49	1.13
North Cent.	10.55	10.84	0.29
Ozark	9.14	9.38	0.24
Piedmont	10.86	11.10	0.24
Southern	8.66	9.33	0.67
Southwest	15.78	14.67	(1.11)
Trans-Texas	8.21	8.29	0.08
West Coast	10.15	10.46	0.31
Average	10.37	10.66	0.29

LOCAL SERVICE AIRLINES
Comparison of Total Revenue Ton-Miles Flown
1955-1956

Carrier	1955	1956	% Increase
Allegheny	5,623,672	6,569,553	16.82
Bonanza	2,374,941	2,910,702	22.56
Central	1,610,648	2,033,980	26.28
Frontier	5,342,820	6,431,653	20.38
Lake Cent.	1,724,745	2,130,759	23.54
Mohawk	5,068,770	6,469,684	27.64
North Cent.	6,950,699	8,775,078	26.25
Ozark	3,759,628	4,980,197	32.47
Piedmont	7,121,317	7,854,801	10.30
Southern	2,990,380	3,488,081	16.64
Southwest	5,255,865	5,909,876	12.44
Trans-Texas	3,811,564	5,293,370	38.88
West Coast	3,353,369	3,626,285	8.14
Totals	54,988,418	66,474,019	20.89

LOCAL SERVICE AIRLINES
Comparison of U. S. Mail Ton-Miles Flown
1955-1956

Carrier	1955	1956	% Increase
Allegheny	90,232	86,867	(3.73)
Bonanza	41,069	49,162	19.71
Central	49,933	46,835	(6.20)
Frontier	194,734	343,405	76.35
Lake Cent.	28,018	26,594	(5.08)
Mohawk	53,918	63,197	17.21
North Cent.	203,208	226,220	11.32
Ozark	81,326	115,452	41.96
Piedmont	135,488	172,230	27.12
Southern	98,025	101,542	3.59
Southwest	80,198	95,993	19.70
Trans-Texas	152,935	161,719	5.74
West Coast	47,839	47,240	(1.25)
Totals	1,256,923	1,536,456	22.24


Serving America's Great Desert Resort Area!
RENO
HAWTHORNE
TONOPAH
LAS VEGAS
KINGMAN
PRESCOTT
PHOENIX
LOS ANGELES INTL.
ONTARIO
RIVERSIDE
BLYTHE
INDIO-PALM SPRINGS
YUMA
SANTA ANA
EL CENTRO
SAN DIEGO
11 YEARS
16 cities in California, Arizona and Nevada
One measure of America's aviation progress is Bonanza Air Lines' eleven-year record of growth. Bonanza has kept pace with the expansion of the West, and by this time next year a new fleet of Silver Dart F-27 turbojet aircraft will be in service. Faster flights and better schedules will continue to be hallmarks of the Bonanza Air Lines' system.
BONANZA AIR LINES

DIRECTORY

(Continued from page 58)

J. H. Connelly

Southwest Airways

San Francisco International Airport
San Francisco, Cal.

First scheduled service started Dec., 1946. Now serving 33 cities, 1,549 system route miles, 11 Douglas DC-3's and 7 Martin 202's, 424 employes.

Chairman: Leland Hayward.
President: John H. Connelly.
VP-Traffic & Sales: T. R. Mitchell.
VP-Pub. Relations: M. A. King.
Chf. Accountant: J. F. Young.
Pur. Agent: A. W. Slater.
Supt. Stations: A. N. Calhoun.
Dir. Flt. Ops.: R. Couk.
Chf. Flt. Supt.: Wm. G. Hall.
Chf. Purser: William Rohrer.
Dir. Maintenance: D. Davison.
Supt. Maintenance: Arnold Boller.
Wash. Counsel: Robert Redding.

R. E. McKaughan

Trans-Texas Airways

Municipal Airport
Houston, Texas

First scheduled service started Oct. 11, 1947. Now serving 42 stations, 50 cities, 3,816 system route miles, 20 Douglas DC-3's, 696 employes.

President: R. E. McKaughan.
Exec. Asst. to Pres.: J. K. Ayer.
VP-Traffic & Sales: L. J. Eichner.
VP-Ops.: H. E. Erdmann.
Treas.: M. L. Muse.
Gen. Sales Mgr.: B. K. Gover.
Mgr. Interln. & Agency Sales: J. W. Beck.
Dist. Sales Reps.: J. A. Allbright, Houston; W. W. Blanton, Dallas; C. P. Briggs, San Antonio; K. P. Banff, Valley; J. B. Fleming, Shreveport; J. Christian, Little Rock; K. Daugherty, Beaumont-Pt. Arthur; T. Kamel, Austin.
Pub. Rels. Asst.: Bill Newkirk.
Chf. Accountant: H. H. Farr.
Mgr. Tariffs: G. J. Barbier.
Acctng. Sup., Rev.: A. C. Sandifer.
Mgr. Stores: F. C. Buck.
Mgr. Mach. Acctng.: T. K. Phelan.
Pur. Agent: W. C. Leatherwood.
Dir. Personnel: P. S. Reid.
Sup. Print Shop.: M. M. Kelly.
Dir. Research: J. C. Crawford.
Supt. Stations: J. L. Herring; **Assts.:** W. W. Franklin, T. O. Brinkley, Marcus Kyle.
Dir. Flt. Ops.: R. E. McKaughan, Jr.
Chf. Pilot: L. A. Downes.
Chf. Dispatcher: W. J. Schoen.
Dir. Psgr. Svc.: J. Rupe.
Dir. Maint.: H. P. Whatley.
Supt. Maint.: T. O. Weathers.
Chf. Insp.: P. F. Glover.
Chf. Engineer: C. L. Baker.
Supt. Comms.: E. W. Helken.
Sup. Reservations: M. O. Poupart.
Wash. Counsel: V. L. Gingerich.

Nick Bez

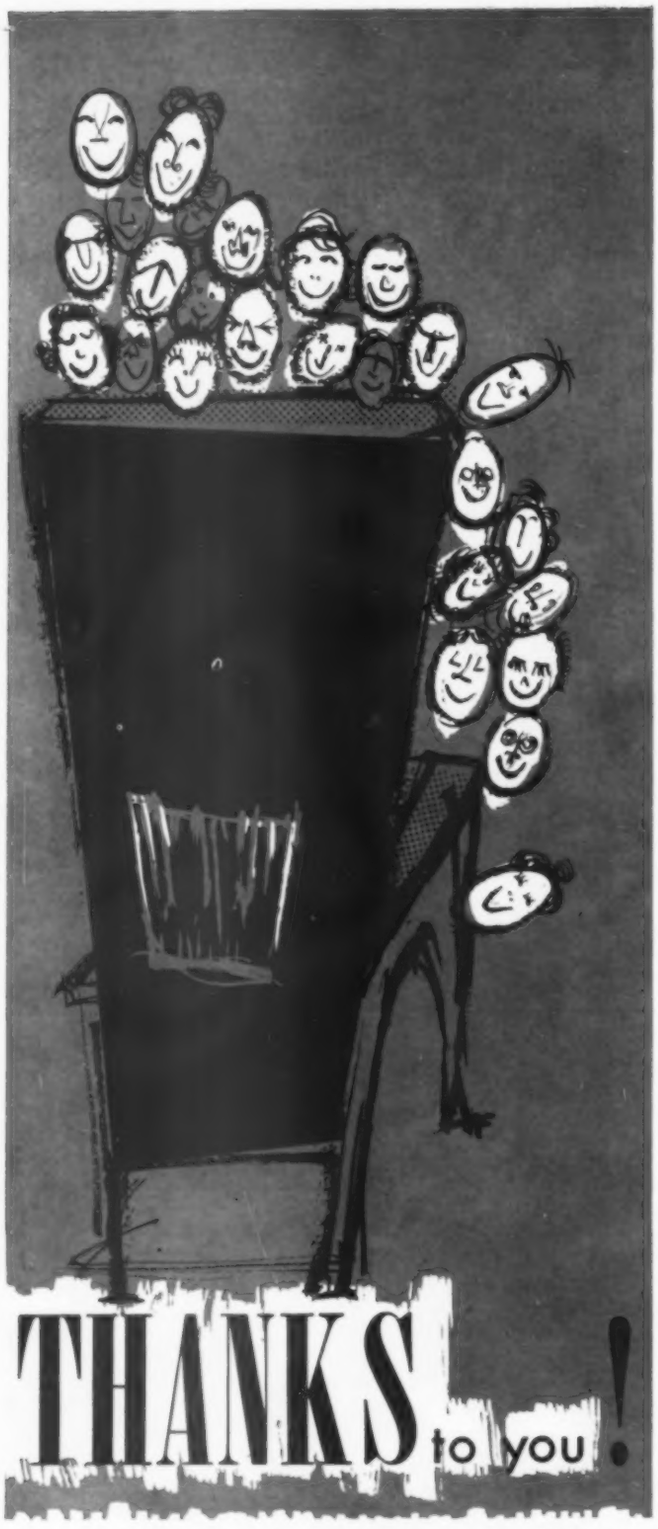
West Coast Airlines, Inc.

Boeing Field,
Seattle 8, Wash.

First scheduled service started Dec. 5, 1946. Now serving 44 cities, 2,200 system route miles, 14 Douglas DC-3's, 466 employes.

President: Nick Bez.
Ex. VP-Treas.: G. Hamilton Beasley.
VP-Sales: Tom Croson.
VP-Ops.: E. B. Code.
Dist. Sales Reps.: George A. Hartwell, Seattle; R. L. Snead, Boise; Curtis C. Dils, Jr., Portland; Bob Duvall, Spokane.
Traffic Mgr.: R. E. Hill.
Dir. Pub. Rels.: Douglas G. Billmeyer.
Scty.-Compt.: Lewis J. Hawkinson.
Chf. Acct.: Kenneth N. Laurin.
Acctng. Sup., Rev.: J. A. Aspitarte.
Pur. Agent: Morris Johnson.
Stores Mgr.: Garbutt Chapman.
Dir. Personnel: John S. Beard.
Sup. Print Shop: Harvey Kyllonen.
Supt. Stations: Harold G. Scull.
Ops. Manager: S. R. Severtson.
Chf. Pilot: D. C. Burkhard.
Mgr. Flt. Sv.: Roland M. Payne.
Chf. Steward: Larry Whittall.
Dir. Maint.: S. M. Selby.
Supt. Flt. Control.: H. E. Wallis.
Res. Mgr.: Nick Bez, Jr.
Wash. Counsel: Leasure, Scheurer & Carter.

How 1,000,000 Southwesterners saw the world
In May TTA carried its 1,000,000th passenger from the growing, air-minded cities of the Southwest to places all over the world. For all-the-way air service, the Southwest travels on TTA, thanks to the trunk airlines' excellent cooperation and connecting service.
TTA
TRANS-TEXAS AIRWAYS
SERVING OVER 50 CITIES IN TEXAS, LOUISIANA, ARKANSAS, & TENNESSEE
Delta



It's nice working with you — 65% of our business was exchanged with you — the connecting airlines

lake central

AMERICA'S ONLY EMPLOYEE-OWNED AIRLINE

AIR TRAFFIC DELAYS BURDENS LOCALS

(Continued from page 65)

the winter, the community is as isolated as though the bridge at the end of Main Street had washed out. Allegheny's air traffic control delays at Bradford for the first quarter of 1957 were more severe in terms of both number and total time than at Newark, one of the most congested areas in the world. The cost of such a situation to local industry in terms of lost manhours, missed appointments and other inconveniences, while difficult to measure, are obviously substantial.

Williamsport, Pa., a city of 45,000, is equally dependent on air transportation as is State College and the neighboring communities Clearfield, Bellefonte, Philipsburg and the vast new industrial project of Curtiss-Wright at Quehanna. Allegheny's air traffic delays were more severe at Williamsport during the first quarter of 1957 than at the very busy terminal point of Pittsburgh. These communities are typical of those on most of the local service systems where scheduled air service has become an economic life-line.

The air traffic situation in all of these points would be helped immeasurably by the installation of airport control towers and approach control with a system of "tower en route control" which is now being used successfully in selected areas throughout the country. With such a system, air traffic could at least be moved on an airport-to-airport basis at lower altitudes without having to coordinate by long distance with big city traffic control centers.

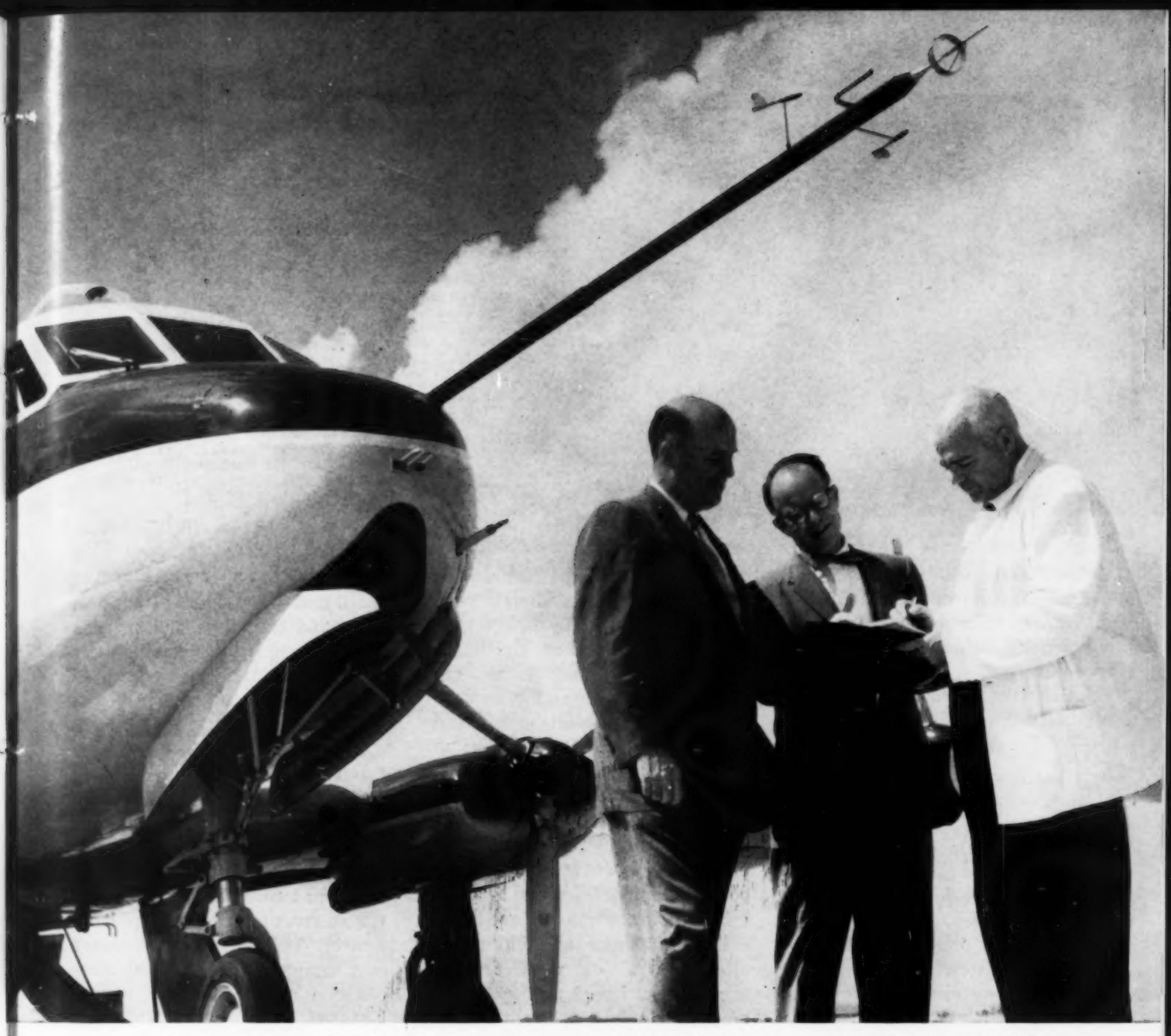
The primary CAA criterion for the establishment of a control tower, however, is 24,000 air movements annually. This criterion makes it more of a big-city facility. With air movements as a primary measurement, only limited allowance can be made for the community's dependence on air service, its isolation, or the fact that a community airport may be used as an intersection for a series of instrument airways thus placing a "lid" in effect on instrument operations to and from an intermediate city. Bradford and Williamsport are on seven airways and the Philipsburg-State College Airport is on eleven. Oddly enough, while a location like Bradford and Williamsport would qualify for approach control facilities if a tower were established at these points, they are short on the count necessary to qualify for such a facility.

The economic problem in an expanded CAA control tower program, which is a key to a localized "tower en route control" program, seems somewhat unrealistic in light of the fact that the absence of such facilities leads to the requirements for a local airline to secure additional subsidies to cover the cost of ATC delay and related losses. Further, the absence of these facilities occasions flight cancellations, making it more difficult to achieve the air movement count necessary to qualify.

The frontiers of this nation are not in the Far West, the North or South, they are in the "grassroot" intermediate cities all over the nation. Competition and industrial development dictate that intermediate cities be well integrated with the national economy through the air transport network.

It is equally important to maintain effective year-round services between major metropolitan centers and cities in the general industrial and marketing areas. This is borne out by recent trends in the local airline traffic pattern. Initially, Allegheny's traffic was 75% interline and 25% online. Today in many instances it is 85% online.

It is important, therefore, that any revision of our Air Traffic Control mechanism, whether it be designed for the Jet Age or other future requirement, provide for the uninterrupted integration by air of the major metropolitan areas and the "grassroot" community.



The vital role of business flying in American economic progress – and vital role of test-proven equipment in business aircraft fleets – is discussed with Fisher by Cessna Executives James Herrick, Fleet Sales, and T. Guy Miller, Sales Manager (L/R). They describe "excellent results" obtained with Champion Spark Plugs during rigorous flight-testing of this new 4-engine Cessna 620 pressurized executive transport . . . and confirm thousands of hours of safe flying with Champions in other Cessna models.

The nation's business aircraft fleets . . .

like the major airlines . . .

keep in flight fitness with CHAMPIONS.

Noted aviation authority reports on . . .

by
HERB FISHER
international aviation authority, veteran test pilot and author

Operation Business Flying

Test Pilot Fisher (L), who flew this plane some 2,465 miles (Wichita-New York-West Palm Beach) with one fuel stop, hears of Champion's long-life dependability and easy accessibility to this Continental engine from Cessna executives, Bill Eikenberry and Bill Fergusson (L/R).

Operation Business Flying

FAMILIARITY with volume testing and selecting of aircraft equipment by leading airlines sparked my curiosity about product performance and preference among individual units of the nation's vast business aircraft fleet.

For here we have a three-fold operational contrast between civil aviation's two largest bodies: Unlike the airlines, the great armada of private craft in the business aircraft fleet comprises nearly every make and model; individual business fleet crews themselves often rate performance and determine selection of their own aircraft equipment; and individual companies put their company-style planes to a variety of use quite beyond that of the airlines.

In looking into the matter with the National Business Aircraft Association, I was struck by the enormity of this non-airline fleet and by its importance in service to the national economy. That the airplane is now playing a commonplace and increasingly vital role in American business and industry was evidenced everywhere at the recent N.B.A.A. Annual Convention in Miami, Florida, attended by more than 600 pilots and executives from over the country. In my 28 years in aviation, I have never met any group more enthusiastic about the utility of the airplane as a safe, efficient working tool. Nor have I ever met pilots more keenly aware of their serious responsibilities regarding objective appraisal of the equipment they use.

I talked with scores of business pilots and executives and checked a lot of records to get the perspective of business flying's growth to maturity in aircraft equipment experience.

In singling out a representative functional plane part to trace in its development and modern-day application, I was struck by the overwhelming preference for Champion Spark Plugs in the multipurpose, multitype business aircraft fleet. The sizable cross section of pilots I objectively polled said they settled on Champions after extensive periods of trial-and-error with various types of spark plugs. They described familiar engine problems al-

Mike Murphy (L), Flight Operation Director, Ohio Oil Company, Findlay, Ohio, tells Fisher: "We've used Champions for many years without problems. I've been in this flying business a long, long time, and I know Champions are tops."

Chief Pilot Robert J. Kusse, Fruehauf Trailer Company, Detroit, recipient of N.B.A.A. Million Miler Safety Award, reports: "Our fleet (Lodestars, D-18's, Ventura, Norseman, Mallard and Bell Helicopter) is tailored for specific needs. Champions, we find, are tailor-made for all our specialized aircraft – and we use Champions in all. Never had any plug problems with Champions."

"Champions afford maximum utilization of our equipment. Champions' trouble-free operation unquestionably contributes to our high degree of on-time departures, an essential requisite in operation of a business fleet." Gerard J. Eger, Secretary, International Harvester Company, Chicago, and a board director of the N.B.A.A.

Dale Westfall, Chief Test Pilot for Cessna Aircraft Company, Wichita, Kansas, points up company policy regarding the new 4-engine Cessna 620: "Our top test-flight performance with the new 620 has included use of Champions from the beginning. My chief mechanic and I have found Champions performance-perfect."

"We received a Safety Award for flying 4,272,894 miles without mishap. Contributing to that record was the use of Champion Spark Plugs. We've had no plug trouble for six years — since using Champions." Ralph E. Piper, Chief Pilot, Monsanto Chemical Corporation, St. Louis, and a board director of the N.B.A.A.

A special report for Champion Spark Plug Company

"We have used Champions for 10 years in our Cessna, Beech and Lockheed fleet. They have always given us extremely good service." Chief Pilot Richard W. Smith, Champion Paper and Fibre Company, Hamilton, Ohio.

"Our fleet of airplanes flew 1,785,000 miles last year. The entire fleet has used Champion almost exclusively. Our millions of miles with Champions the past twelve years have shown us that they are safe and reliable." N.B.A.A. President Henry W. Boggess (L), Director of Aviation, Sinclair Refining Company, Tulsa, Oklahoma and Joe Lacey (C) Sinclair's Chief Pilot.

leviated only by proper application of Champions.

This singular experience with nearly all types of aircraft equipment – to procure the best parts possible for maximum efficiency in a wide variety of flying operations by a wide variety of plane types – is synonymous with business flying's spectacular development.

Few companies realized the advantages of operating their own business aircraft prior to World War II. Aviation equipment studies were unheard of in private business and industry. Of a total of 4,460,000 hours flown by all non-airline utility aircraft in 1941, only 250,000 hours were for business purposes while some 883,000 hours were recorded for pleasure flying.

At the war's end, however, with booming business competition and a shortage of airline transportation, ingenious business executives supplemented airline travel with company-owned and operated planes; many were former military transports. And such questions as, "What's the best equipment for us – the best spark plugs, for example?" became commonplace.

Private companies were then in the business of aircraft maintenance. Their plane crews found themselves in almost daily involvement in the procurement of aircraft equipment suitable to the company's specialized needs regarding plane types and operational purposes. Duties of the tailor-made fleet ranged from executive travel in multi-engine jobs to cross-country industrial map-making.

In 1955 the nation's vast business fleet had reached maturity in the application of aircraft parts and equipment to its varied operation. Our little barometer of trial-and-error product success – the Champion Spark Plug – had come into its own as an almost exclusive spark plug in many types of aircraft engines. Business flying chalked up an impressive 4,300,000 hours that year alone. And the hours continue to climb, holding promise of 5,700,000 hours by 1960 . . . 7,800,000 hours by 1965 . . . and 9,900,000 hours by 1970.

Thus, the small, almost insignificant business aircraft fleet of the early 1940's has become the mature giant of the late 1950's, overshadowing every other development in the field of transportation—a growth rate paralleling the progress of far-sighted industry and business. The business executive, salesman and engineer found new mobility—6,000 airports for his access by company plane as compared to but 600 terminal airports available by domestic carriers.

Today some 6,000 companies are using approximately 21,500 privately owned aircraft to transport their personnel and customers, and in many cases cargo, in the daily conduct of business. Some 2,400 are multi-engine aircraft, most of them equipped with the very latest in navigation and electronic equipment, as well as with Champion Spark

"Champion Spark Plugs are synonymous with dependability," Charles Morris (R), Chief Pilot, Socony Mobil, New York, tells Fisher (L). "Our 28-plane fleet operates all over the world. Champions guarantee top engine performance under any conditions." W. R. Dotter (Center), Chief Pilot, International Harvester, Chicago, reports: "Our fleet flies 800 hours a year per plane. We've used Champions from the beginning of our business flying 10 years ago and never have had any trouble with them."

"Nowhere in the history of a single test program has the DC-3 been put through three complete engine configurations as has this Challenger 250. We started with 92's, ran a complete 4B program plus 94's and R2000's. We pulled take-off horsepower with Champions for as much as seven continuous hours with no plug failures. This airplane has since flown through all kinds of weather and climate in North and Central America – and our Champion installations have proved without equal." So spoke Captain Jim Hurst, Executive Vice President of Aircraft Conversion Corporation, Detroit, a 12,000-hour pilot and former employee of Pan-American World Airways for 14 years. Pictured (L/R): H. C. Walls, Supt. of Field Operations, Miami International Airport; Captain Joe Clemow, Chief Pilot for Eastman Kodak, Rochester, New York; and Captain Hurst.

"We use Champions almost exclusively in our DC-3 and DeHavilland business fleet. We'll swear by them." Frank J. Dolinski, Chief Pilot, Aerojet-General, Azusa, California.

Plugs. There are also 19,000 single-engine planes and helicopters in business operation. The entire business fleet's record of safety and dependability is testimony to the proficiency of the pilots and efficiency of the aircraft and equipment they use.

Closely tied to the success of business flying is the N.B.A.A., organized in 1947 by 13 members operating 19 business airplanes. The N.B.A.A. represents the aviation interests of its members, presenting a united front in matters requiring organized action to improve aircraft, equipment and service, and furthering the cause of safety and economy in business plane operations. Present membership includes some 400 leading business organizations operating more than 1,000 aircraft, over 600 of which are multi-engine.

Champion staunchly endorses the N.B.A.A.

Proof of the N.B.A.A. member companies' adherence to the principles of safe operation of dependable aircraft and equipment lies in its annual Safety Award presentations. Twenty-nine pilots who had flown more than 1,000,000 miles each without accident or injury were honored at the Miami convention, as were 26 companies that had recorded a total of 47,036,788 consecutive accident- and injury-free miles flown with business aircraft. N.B.A.A. Safety Awards represented 121,908,052 hours of flying completely accident-free. Pilots emphatically told me that the attainment of such safety records would not be possible without the cooperation of the ground service operators throughout the country . . . and without the top-flight parts and equipment of American industry, such as Champions.

For their excellent cooperation in helping me obtain information at the Miami Convention, I wish to thank Bill Lawton, *N.B.A.A. executive director*, and his cheerfully efficient secretary, Corda Mae Cearnal, better known as "C.M."

— HERBERT O. FISHER

CHAMPION CONGRATULATES RECIPIENTS OF 1956 N.B.A.A. SAFETY AWARDS

Some of the pilots receiving N.B.A.A. Safety Awards for flying more than a million miles without accident or injury. Center is Miss Pat Walker, "Miss Business Aviation of 1956," and at her right, J. V. Swanson, Chairman of N.B.A.A. Awards Committee and Chief Pilot for Sears Roebuck.

N.B.A.A. Member-Pilot "Million-Miler" Safety Awards

1,000,000 OR MORE ACCIDENT- AND INJURY-FREE MILES FLOWN IN BUSINESS AIRCRAFT

NAME OF "MILLION MILER"	ORGANIZATION	CONSECUTIVE PLANE MILES FLOWN
ROBERT F. ALLEN	Frankfort Oil Company, Tulsa, Okla.	1,488,379
RAOUL CASTRO	International Harvester Company, Chicago, Ill.	1,153,039
L. P. CORNWALL	Chrysler Corporation, Detroit, Mich.	1,075,000
W. R. DOTTER	International Harvester Company, Chicago, Ill.	1,141,216
AL EAGER	Crane Company, Chicago, Ill.	1,071,000
E. W. ESTELLE	Esso Shipping Company, New York, N.Y.	1,516,250
HARVEY H. GLASS	Texas-Illinois Natural Gas Pipeline Co., Chicago, Ill.	1,296,000
ROBERT L. HANSEN	Kroehler Mfg. Company, Naperville, Ill.	1,017,650
W. P. HOBSON	Hercules Powder Company, Wilmington, Del.	1,161,299
JACK C. JONES	Fairbanks, Morse & Co., Chicago, Ill.	1,800,000
JAMES E. KIDD	Anchor Hocking Glass Corp., Lancaster, Ohio	1,034,600
LOREN D. KIRBY	Universal Moulded Products Corp., Phila., Penn.	1,046,544
A. C. KORB	Westinghouse Electric Corp., Pittsburgh, Penn.	1,000,000
ROBERT J. KUSSE	Fruehauf Trailer Company, Detroit, Mich.	1,013,308
J. SHELDON LEWIS	Thatcher Glass Mfg. Co., Inc., Elmira, N.Y.	1,108,000
C. J. LUND	International Paper Co., Mobile, Ala.	1,131,700
S. M. MAXWELL	Burlington Industries, Inc., Greensboro, N.C.	1,107,915
B. OWEN MAYFIELD	Hercules Powder Company, Wilmington, Del.	1,370,619
GEORGE E. MEYERS	Monsanto Chemical Company, St. Louis, Mo.	1,150,000
N. L. MITCHELL	Minneapolis Star & Tribune, Minneapolis, Minn	1,156,750
RALPH E. PIPER	Monsanto Chemical Company, St. Louis, Mo.	1,152,000
G. P. RIDER	Delta Drilling Company, Tyler, Texas	1,044,000
NELSON U. ROKES	Procter and Gamble Co., Cincinnati, Ohio	2,800,608
THOMAS J. SCHUETZ	International Harvester Company, Chicago, Ill.	1,140,969
G. W. SHERWOOD	Briggs Manufacturing Company, Detroit, Mich.	1,182,060
ORVILLE E. SPARKS	Holley Carburetor Company, Detroit, Mich.	1,019,024
D. M. TEEL	U. S. Steel Corporation, New York, N.Y.	1,017,000
R. N. THURSTON	Monsanto Chemical Company, St. Louis, Mo.	1,226,048
C. H. VON HOLLEN	Union Bag-Camp Paper Corp., Franklin, Va.	1,200,000

N.B.A.A. Member Meritorious Safety Awards

1,000,000 OR MORE ACCIDENT- AND INJURY-FREE MILES FLOWN IN BUSINESS AIRCRAFT

NAME OF ORGANIZATION	CONSECUTIVE PLANE MILES FLOWN
ANCHOR HOCKING GLASS CORPORATION, Lancaster, Ohio	1,430,000
ARMCO STEEL CORPORATION, Middletown, Ohio	1,174,248
BURLINGTON INDUSTRIES, INC., Greensboro, North Carolina	3,596,701
CHAMPION SPARK PLUG COMPANY, Toledo, Ohio	1,037,540
CLUETT, PEABODY & CO., INC., New York, N.Y.	1,597,500
COLUMBIA-GENEVA STEEL, San Francisco, Cal.	2,632,885
DELTA DRILLING COMPANY, Tyler, Texas	1,044,000
ESSEX WIRE CORPORATION, Fort Wayne, Ind.	1,267,000
ESSO SHIPPING COMPANY, New York, N.Y.	3,556,895
S. J. GROVES & SONS CO., Minneapolis, Minn.	1,110,000
HERCULES POWDER COMPANY, Wilmington, Del.	2,292,112
HOLLEY CARBURETOR COMPANY, Van Dyke, Mich.	1,286,852
INTERNATIONAL HARVESTER COMPANY, Chicago, Ill.	1,937,250
INTERNATIONAL PAPER COMPANY, Mobile, Ala.	1,897,557
KROEHLER MANUFACTURING CO., Naperville, Ill.	1,752,200
MINNEAPOLIS-HONEYWELL REGULATOR CO., Minneapolis, Minn.	1,635,000
MINNESOTA MINING AND MANUFACTURING CO., St. Paul, Minn.	1,421,969
MONSANTO CHEMICAL COMPANY, St. Louis, Mo.	4,272,894
OWENS-ILLINOIS GLASS COMPANY, Toledo, Ohio	1,816,265
THE PROCTER & GAMBLE COMPANY, Cincinnati, Ohio	1,584,754
SOUTHERN NATURAL GAS COMPANY, Birmingham, Ala.	2,493,862
TEXAS GAS TRANSMISSION CORPORATION, Owensboro, Ky.	1,100,000
TEXAS-ILLINOIS NATURAL GAS PIPELINE CO., Chicago, Ill.	1,397,520
THOMPSON PRODUCTS, INC., Cleveland, Ohio	1,370,000
UNITED STATES STEEL CORPORATION, New York, N.Y.	1,285,240
UNIVERSAL MOULDED PRODUCTS CORPORATION, Philadelphia, Penn.	1,046,544

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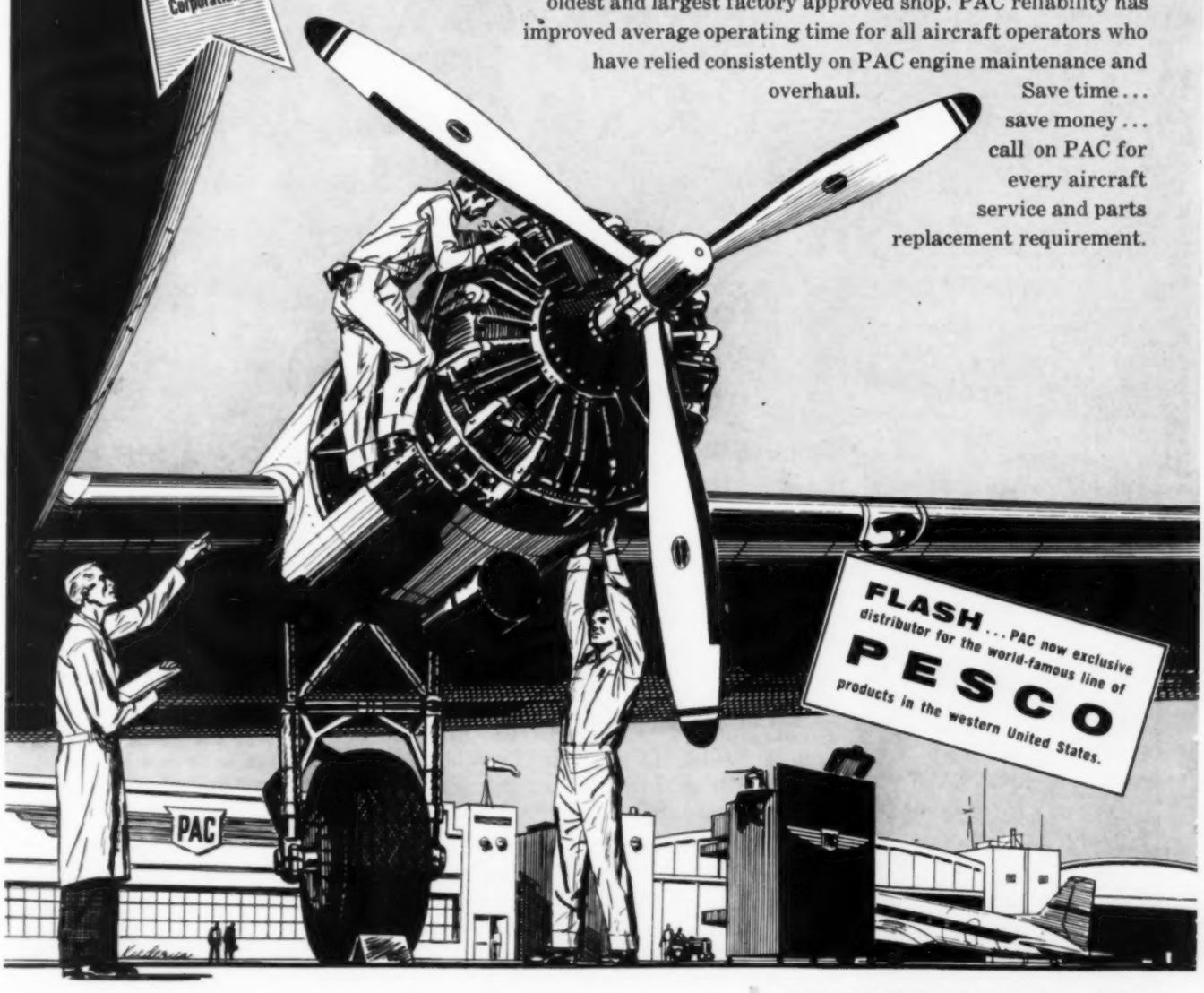
Save time... save money... call on PAC for every aircraft service and parts replacement requirement.



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BLIND FLYING – 'COPTERS CAN DO!

Pilots generally have been skeptical of the practicability of adapting blind flying techniques to helicopters. At the Army Aviation Center, Ft. Rucker, Alabama, however, 'copter pilots are being trained to fly under zero-zero conditions, using an adaptation of conventional GCA equipment.

Meanwhile, CWO Clifford Turvey, Project Officer for the Instrument Program, is working closely with Bell engineers in the development of new instrument flight equipment specifically for helicopters. He predicts that unqualified success will crown these efforts — and that soon helicopters will fly as a matter of course, regardless of the lack of visibility and ceiling.

Mr. Turvey, a veteran of Medical Corps service in Europe during World War II, graduated in 1951 with the second class of Army rotary-wing pilots from Ft. Sill, and flew hundreds of missions of every conceivable sort during 16 months in Korea. He is qualified to fly all types of Army helicopters, although he reports that of the more than 2,500 hours he has logged, most of them have been in Bells.

Helicopter flight and mechanical training are available to qualified personnel at the U. S. Army Aviation School, Ft. Rucker, Alabama.

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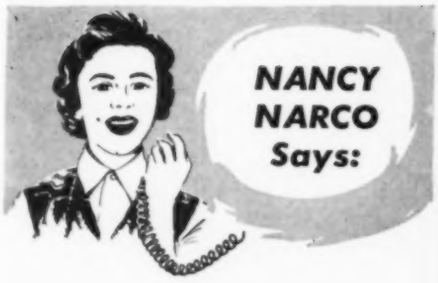


SEEMS A LOT OF US still don't have this communications channel business straight. It's not surprising, since I've been getting different stories from several different "experts." (If these guys didn't *say* they were experts I'd suspect they didn't know for sure what was going on.)

LEARNED A FEW THINGS, tho'. Let's whip up a "fer instance." Take the tower over at Reading, nestled in the Pennsylvania hills and almost entirely surrounded by Dutchmen. You wouldn't call it a congested area—except when Reading Aviation throws its annual Fair (which comes June 1 this year.) The very fine control tower does business on 119.1 mc.

IF YOU TUNE READING tower quite a while before you're in close, you find the frequency real crowded. Check the Airman's Guide and, sure enough—Washington National, 120 miles southwest, is also on 119.1. But don't quit yet—wasn't that a KLM Connie calling? Yep—book shows same frequency at Idlewild International Air Patch, 115 miles east of Reading. No wonder the channel is crowded!

WHY DON'T THEY use different frequencies? Let's check. In the area between Washington and Providence, and from about Harrisburg and Binghamton to the coast, there are 27 control towers, using 12 "ordinary" VHF frequencies (118.1, 118.3 . . . 121.3) exactly 35 times. Most of these 12 frequencies are used 3 times.

ACTUALLY, it's not the cross-talk between towers themselves that clutters the channel, but that between *aircraft talking* to the two different towers.

THE WHOLE SET-UP is getting *more* crowded all the time, so what to do? Well, for one thing, they're trying to put the more exotic communications (radar control, much of the direct Center communications) on channels between 123.7 and 126.7 mc where they won't interfere with primary tower frequencies. For another thing, they're starting to use frequencies *between* those we're used to—even-tenth megacycles like 120.4 and 120.6 for *other* than primary tower communications.

LOTS OF FINE PILOTS have never landed at Chicago Midway or Washington National, but the ones I've talked to want to be able to do it real smooth *if* and *when*. That means more channels—better figure on having them.

See y'all next month,

Nancy

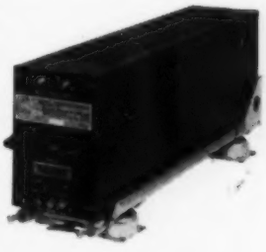
NARCO • Fort Washington, Pa.

narco Sapphire 1016

90 or 360 CHANNEL TRANSMITTER
90 or 560 CHANNEL RECEIVER

When you see an aircraft with the Narco Sapphire 1016 antenna you know it's equipped with the ultimate in fine communications. Designed for reliable VHF communications on every frequency provided for present and future civil aircraft communications, the 1016 has a VHF transmitter capacity of 90 or 360 channels and crystal-controlled receiver of 560 channel capacity. Precise 50 kc separation is provided through the entire range from 108 to 135.95 mc.

The Sapphire 1016 is CAA-certificated for airline use and matches the quality, performance and dependability of the finest airline-type equipment. Yet its price compares with limited channel equipment normally used in executive aircraft.



1016 unit occupies ½ ATR rack; total weight 24¾ lbs.

NOW! PRECISION VOR/ILS CONVERTER FOR THE 1016

Now you can add VOR/ILS localizer function to the Sapphire 1016 with the Narco VOA-3 converter-indicator. Adaptable also to the Narco Simplexer. Fits any standard instrument cut-out; total weight, including remotely-installed converter unit, 4 pounds. Extreme accuracy and reliability. Only the Sapphire 1016 permits addition of VOR to crystal-controlled communications equipment.

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Your New Navy stands today as a nuclear-age bulwark of freedom, a powerful deterrent to aggression.

Leadership, manpower and mobility form the taut core of this strength. But to be an *effective force* the Navy must have *effective weapons*.

Chance Vought, with 40 years in the high performance military aircraft field, is dedicated to the complex science of developing and producing those vital weapons.

Record-breaking *Crusader* jet fighters, now in squadron status, and *Regulus* guided missiles, on station and ready for use when needed, represent a portion of Vought's growing contribution to Navy strength—a strength that means power for peace throughout the world.

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TAC's most versatile bomber

THE DOUGLAS B-66 DESTROYER

Capable of carrying an H-bomb over long distances – or serving as The Tactical Air Command's "aerial eye" in high altitude photo-reconnaisance, – the Allison-powered Douglas Destroyer is TAC's multipurpose first-line bomber.

Two Allison J71 Turbo-Jets, each producing more than 10,000 pounds' thrust, give this bomber speeds of more than 600 mph with fighter response at maximum altitude. Allison engines are designed and built by America's pioneer producer of turbine aircraft engines.

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"Take it from me, George... the safest engine is a clean engine... and there's no cleaner engine than a Gulf-lubricated engine!"

Use new Gulfpride Series D, the detergent oil, or Gulf's Aircraft Engine Oil, the straight mineral oil. Either way, you'll be keeping your engine clean, and playing it safe.

Not only do Gulf's oils lubricate engines thoroughly and efficiently. They also keep engines clean.

That means increased periods between engine overhauls, because of less wear and tear on engine parts.

Gulf's Aircraft Engine Oil is the finest straight mineral oil you can choose—keeps engines as clean as any straight mineral oil can. But for the greatest possible cleanliness, buy Gulfpride Series D, the detergent oil.

Gulfpride Aviation Oil—Series D. Detergent Oil—for greatest possible cleanliness in radial, inline and horizontally opposed engines.

Gulf Aircraft Engine Oil—Straight Mineral Oil that minimizes sludge and oil inlet screen deposits, keeping your engine clean and safe.

GULF
AVIATION PRODUCTS

...the world's finest aviation products

One of North American's three Apaches takes off over F-100 Super Sabre

PIPER APACHES HELP SPEED F-100 SUPER SABRE PRODUCTION

To meet their requirements for fast, economical, interplant transportation, North American Aviation, Inc., world's largest builder of military airplanes, chose the twin engine Apache built by Piper, world's largest manufacturer of civilian aircraft.

Before the Apache was chosen, an evaluation of all available twin engine aircraft was made for the company's special transportation needs by three separate groups at North American. The Chief Engineering Test Pilot studied flight characteristics, engineering features and structural integrity; the Chief Transport Pilot evaluated utility; the General Supervisor of Flight Test checked all-around performance and maintenance.

As a result of these three separate evaluations it was concluded that the Piper Apache was the best airplane to fill this specific transportation requirement at lowest cost with no compromise in quality, structural integrity, flight characteristics and performance.

Since selecting the Apache a year ago, North American Aviation's fleet of three Apaches has flown over 2,400 hours—30 per cent on IFR flight plan. The Apache has far surpassed North American's expectations.

PIPER *Apache*

WORLD'S LARGEST SELLING TWIN ENGINE EXECUTIVE TRANSPORT

4 or 5-passenger capacity. 170 mph cruising speed; up to 1,200-mile range. Powered with two 150 hp Lycomings. For full information see your Piper dealer or write for catalog, Dept. F-6.

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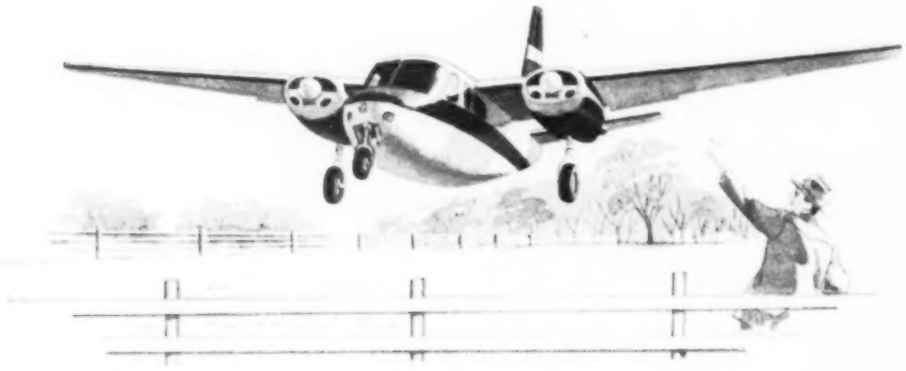
what's your ACIQ ?*

	560-E	680-Super
High Speed, rated power—10,000 ft.	222 mph	260 mph
Cruising Speed, 70%—10,000 ft.	210 mph	230 mph
Stall Speed, gear and flaps down, power off	66 mph	71 mph
Take-off Distance to clear 50-ft. obstacle at S/L	1,452 ft.	1,540 ft.
Landing Distance to clear 50-ft. obstacle at S/L	1,500 ft.	1,625 ft.
Gross Weight	6,500 lbs.	7,000 lbs.
Useful Load	2,200 lbs.	2,670 lbs.
Range, with 30-minute reserve	1,625 mi.	1,480 mi.
Service Ceiling, 2 engines	22,500 ft.	24,200 ft.
Ceiling, one engine	8,000 ft.	15,000 ft.
Rate of Climb, S/L	1,450 ft/m	1,600 ft/m



short-field performance

Actually, Aero Commanders are operating daily out of small sod fields all over the country. Timber men in the Northwest, oil operators on the plains and sand beaches, construction men at remote job sites—all give testimony to the versatility of this executive transport. The take-off and landing figures above are based on a full gas load.

The choice of men at the top
Kings·Presidents·Executives

AERO Commander
560-E - 680-S

*Aero Commander Intelligence Quotient - one of a series

AERO DESIGN & ENGINEERING CO
TULAKES AIRPORT • P. O. BOX 118 • BETHANY, OKLAHOMA

COMPARE & DISCOVER

COMPARE the Mark 20 with other four-place executive airplanes.

DISCOVER why the Mark 20 is years ahead in styling and performance.

	Mark 20	Plane Type 82	Plane Type 72	Plane Type 22
PERFORMANCE				
Cruising Speeds (70% h.p.)	165 mph	155 mph	124 mph	128 mph
Engine h.p.	150 hp	230 hp	145 hp	150 hp
Range	900 miles	655 miles	620 miles	525 miles
Pay Load	720 lbs.	679 lbs.	673 lbs.	669 lbs.
Rate of Climb	900 ft./m	1030 ft./m	660 ft./m	725 ft./m
Service Ceiling	17,200 ft.	19,800 ft.	13,330 ft.	15,000 ft.
SAFETY				
Military proven low-wing visibility	Yes	No	No	No
Tubular steel safety cabin	Yes	No	No	Yes
All-weather adjustable engine cooling systerh.	Yes	No	No	No
Non-fatigue spruce wing	Yes	No	No	No
ECONOMY				
Miles per gallon	20	12.7	15	14.7
Cost per engine hour of operation (Based on engine exchange prices)	$1.00	$3.45	$1.50	$ .93
Fuel cost per mile	2c	2.8c	2.4c	2.6c
Total cost per mile (Based on 600 hours operation per year)	6.6c	9.8c	8.2c	8.3c

•The Mark 20 is the first "really new" executive plane in years. Its new aerodynamic design features of the jet age produce greater performance with less horsepower. Mooney wants comparisons. Mooney wants you to be the judge.

•The years-ahead Skystreak Styling of the Mark 20 brings to you a combination of economy, safety, and high performance. Features include laminar flow wing, no-drag trim, full sky visibility, retractable tri-cycle landing gear, and low center of gravity for ease of handling on the ground and in strong cross winds.

•You're years and money ahead when you own a Mark 20. Make comparisons, get the facts. See your Mooney distributor.

MOONEY AIRCRAFT INC., KERRVILLE, TEXAS

MOONEY AIRCRAFT, INC., Kerrville, Texas

I am interested in
- ☐ purchasing a Mark 20
- ☐ Mark 20 sales franchise.
- ☐ Information on the Mark 20.

Name

Address

City and State

Rancho Las Cruces resort is on the Gulf of California, right around the bend from La Paz, Baja California, Mexico. This photo looks from a hilltop home being built by Al Rodriquez, who operates two super fishing resorts. Hotel facilities are behind palms.

Viene Mar-leen!

Down Mexico way that means here comes the marlin

By GEORGE E. HADDAWAY

FLIGHT MAGAZINE Photos by John E. King, Jr.

BLESSED are the airplane users for they shall catch marlin!

Only those fortunate few out of millions of fishermen who have experienced a marlin hunt can know the special thrill that comes from the Mexican boatman's yell of "Viene Mar-leen!" as his seahawk eyes spot the crescent tails ripping through the water. For you really don't go fishing for marlin — you hunt 'em, then try to catch them. It's a surface sighting and mostly a surface fighting job.

We experienced that thrill last month down on the Tropic of Cancer near the juncture of the Pacific Ocean and the Gulf of California — the world's greatest marine trap that literally teems with the largest variety of sea-going game fish known to man.

Our five-day expedition for marlin actually started last fall in Chicago during the National Pilots Association's annual meeting when corn processing businessmen, Bob Fisher and Jack Meyers of Keokuk, Iowa, gave us the word on what they termed the biggest and best billfish pasture in the Western Hemisphere. Bob and Jack have the general reputation of being honest men but their fantastic claims of the kind of fishing they had around the bend from La Paz, Baja California, seemed a bit on the side of enthusiastic exaggeration. Having talked often to deep sea fishermen who had hunted marlin and sailfish up and down the Atlantic and Pacific coastlines, Bob Fisher's claims seemed fantastic. I agreed to fly down during the spring and find out for myself.

Along with John King of the Dallas Morning News, a former pilot, and Pilot Jack Meyers, head of the Hubinger Company's aviation department,

This fast Super Aero Commander 680 was our magic carpet to Las Cruces, a 6-hr. flight. Jack Meyers (left), aviation department head of the Hubinger Company, Keokuk, Iowa, was our pilot. With him is Bob Fisher, pilot-businessman and partner in the two fishing resorts.

The 3,700-ft. landing strip at Rancho Las Cruces accommodates DC-3's and Lodestars. La Paz Municipal Airport's 5,000-ft. runway is 8 minutes away by Bonanza. Map shows La Paz near tip of Baja California. Our route was Dallas-El Paso-Los Mochis-La Paz.

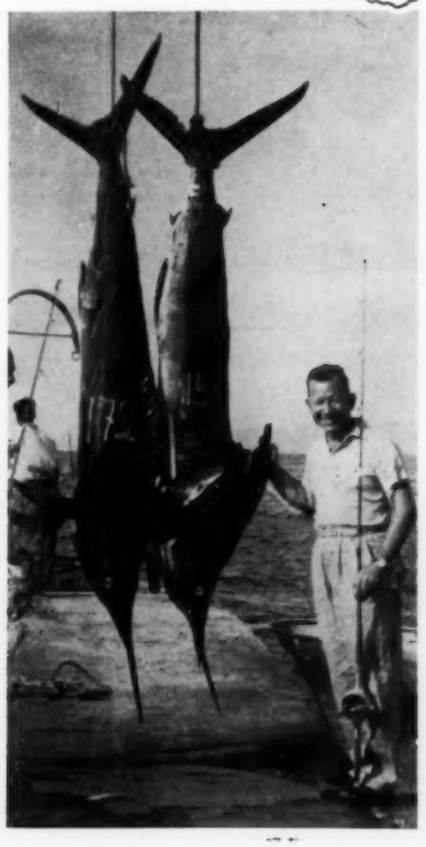
off we flew in Hubinger's Super 680 Aero Commander, only six hours' flying time from Dallas to the Rancho Las Cruces landing strip right on the Gulf of Lower California. We stopped at El Paso-Juarez on the Texas border for customs clearance and lunch. Coming back we cut about ten minutes off the six-hour mark. We had head winds both ways.

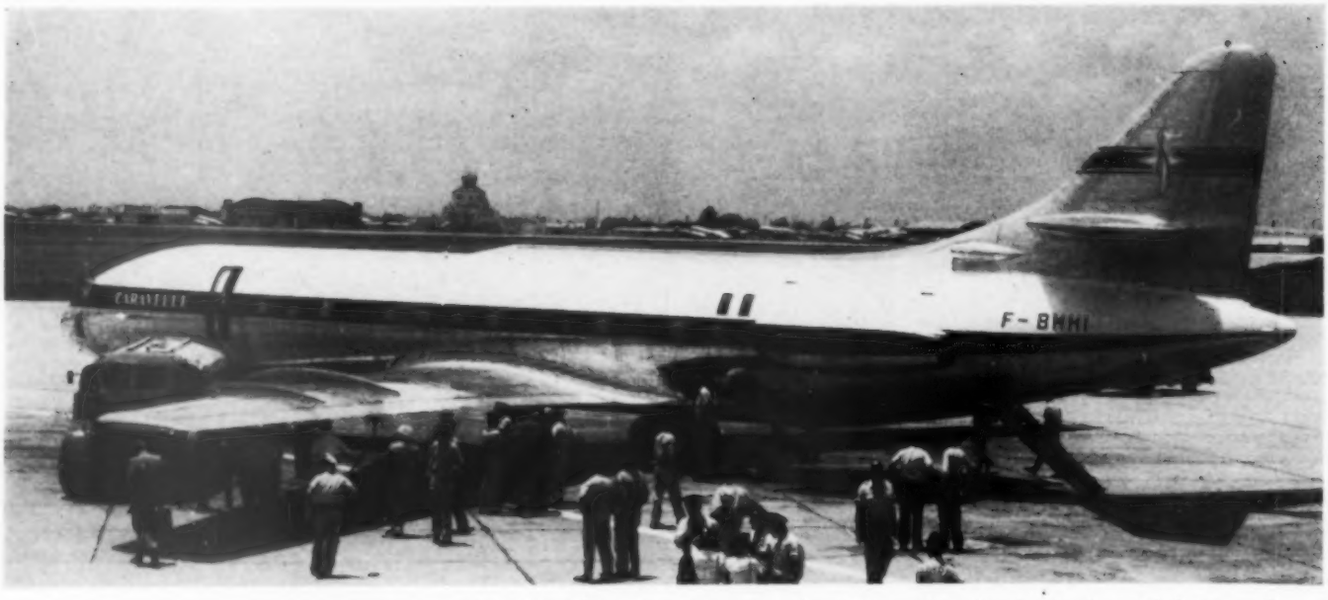
What Bob Fisher did not tell us in Chicago was that he and Al Rodriguez, one-time North American test pilot, owned in partnership two of the most magnificent resort hotels to be found anywhere, the older one called Rancho Las Cruces, converted from an abandoned 20,000-acre Mexican ranch and the newer one some eighty miles to the South, Las Cruces Palmilla, which has just been completed and sits high on a perch overlooking the Pacific Ocean on the very tip of the Baja California peninsula. Both have adequate landing strips right at the back door and both are truly out of this world.

Rodriguez started Rancho Las Cruces seven years ago. Bob Fisher went as a paying guest during the early days and three years ago bought a half interest in the properties, spending much of his time there, now with his charming wife, Ruth. Rancho Las Cruces is all one could ask for as a resort-fishing hotel; but Palmilla, with its white columns and arches and breath-taking view of the pounding

(Continued on page 118)

Below is "Palmilla," located on the very tip of Baja, California, and operated by Rancho Las Cruces. It accommodates 40 persons. Friend John King is shown with two marlin our boat landed, the numbers being their weights.





First jet airliner to visit many American cities, here's the beautiful Caravelle on the Houston ramp after our hop from Miami. Rear-mounted Rolls-Royce Avon engines are shown below, left, with Martin-type tail passenger ramp. Bottom view shows low-to-ground wing, rear engine installation and high tail-plane.
(FLIGHT MAGAZINE Photos.)

Medium-Range Jet Airliner

Trip proves Caravelle has world's quietest cabin

By TOM ASHLEY

WE have finally experienced perfect comfort for passengers traveling in an airplane from Point A to Point B in a hurry. The ultimate in pleasure aloft came to us in the No. 2 prototype of the beautiful new French twin-jet Caravelle medium-range airliner. Point A was Miami and Point B, a thousand miles across the sea, was Houston.

Headwinds at our 31,000-ft. cruising altitude belittled the Caravelle's 445-mph. air speed. But nothing could take away from the comfort designed into the Caravelle's very modern passenger accommodations. This was the world's quietest airplane cabin and to capitalize on such a distinction, hi-fi music was played by tape recording over a faultless cabin speaker system. In the total absence of any evidence or faintest suggestion of horsepower or airflow around the cabin at jet speeds, every subtle musical note was easily audible. It was as if the cabin had been engineered as a hi-fi salon, rather than for transportation, for there was never a shake or a jolt or even a tiny vibration — we were simply suspended in space with pretty music all about us, and even this was so expertly modulated that conversations could be whispered.

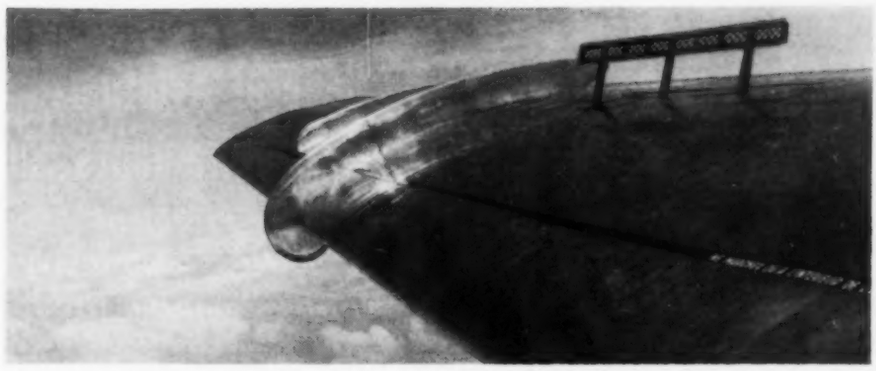
Our Miami-Houston hop was one of many demonstrations staged in America during May and June by Sud Aviation, the large French government aircraft company, and Re-

public Aviation, which has a U. S. licensing agreement to construct the Caravelle if sufficient American orders can be obtained. "Jet speed for all the nation at best economy of any medium-range airliner" — that's the sales description of the Caravelle, for which 1958 deliveries are offered at just under $2,000,000 per airplane. This price makes it possible to buy five Caravelles for less than the cost of two giant American jet airliners, such as the Boeing 707, and emphasizes the fact that the Caravelle by comparison is a small airliner, with half the power, less than half the seating at 64 passengers, half the range at 2,200 miles and about 100 mph. less speed than the big American jets.

Taking off from Miami with 80-degree outside air temperature, and the Caravelle prototype grossing 87,000 lbs., we were off the ground within 3,200 ft. Take-off speed was 120 knots (138 mph.), using 8,000 rpm. as 100% power for the two 10,000-lb.-thrust Rolls-Royce Avon jets.

These engines are mounted on the sides of the fuselage behind the cabin, making the Caravelle the first airliner to feature tail-mounted power plants. This frees the wing of engine clutter, leaving it aerodynamically clean. It also (1) moves jet inlet and exhaust noises behind all passengers for maximum cabin soundproofing, (2) locates the engines for maximum center-line thrust advantages to eliminate yaw or control correction for one-engine-out operation, (3) makes for more efficient engine operation at steep angles of attack as in a climb from take-off, and (4) elevates the engines sufficiently above the runway (9 to 10 ft. off the ground) to eliminate damage from foreign objects being sucked into the intake.

Despite high cabin pressurization of 8.25 lbs. per sq. in. at 40,000 ft., Caravelle has big triangular windows.
—(FLIGHT MAGAZINE Photos.)



From 31,000-ft. cruise altitude, we made normal 6,000-fpm. descent with perforated spoilers (right). Note two aerodynamic "fences" outboard of spoiler. They prevent stall spread at low speed. Wing has drooped leading edge.
—(FLIGHT MAGAZINE Photo.)

Two Air France captains were flying the Caravelle on our trip, Pilot Lionel Casse and Co-Pilot Andre Lesieur. After hoisting the nose to become airborne for take-off, they left it pointed upward instead of leveling off to pick up speed, and the Caravelle accelerated to 250-knot (290-mph.) climb speed long before reaching the end of the runway. Initial rate of climb was better than 1,500 fpm. and we reached 31,000 ft. in 43 mins., averaging 700 fpm. for the climb, using climb power of 7,300 rpm.

Cruising out at 31,000 ft., power was reduced again to 7,100 rpm. for an indicated air speed of 243.5 knots (280 mph.) and a true air speed of about 445 mph. The No. 2 prototype, apparently, is what can be called a Mach .67 airplane, for that was our cruising speed and in going over the airplane's travel log while in America we noted this was the usual cruising altitude, power and air speed. This is with 10,000-lb. Avons. Production models will be powered by 11,500-lb. Avons and will cruise at 475-515 mph. They will also gross 94,800 lbs., provide for a 19,840-lb. maximum payload, have 4,887-gal. fuel capacity for a 2,200-mile range with 64 passengers. The production model is being certificated for operations from 6,000-ft. runway length.

We maintained cruising altitude until we were only about 7 minutes, or about 45 miles, out from Houston International Airport. Then perforated dive-brake spoilers, one atop and one below each wing, were extended at cruising speed, chopping the air speed by 100 knots (175 mph.) within seconds, for a rapid 6,000-fpm. rate of descent. This is a normal procedure letdown rate. An emergency letdown of 12,000 fpm. can be made to reach lower altitudes in a hurry.

Traffic pattern speed was the normal 140 knots (160 mph.) used by piston-

(Continued on page 113)

French hostesses demonstrate absence of cabin vibration by balancing cigarettes and wine glass atop rim of another at 445-mph. speed.

Claude J. Teyssier, Caravelle sales representative in U. S., quotes praise by Dick Merrill (right), U. S. airline pioneer pilot, who made trip with us.

General Aviation Facilities Requirements Survey

A report to the President's Special Assistant by the General Aviation Facilities Planning Group

Part 2

Operating Patterns Of General Aviation Fleet

EDITOR'S NOTE: The above-titled special report to President Eisenhower's special assistant for aviation facilities planning, Edward P. Curtis, holds such significance in the broad field of general aviation that FLIGHT MAGAZINE is publishing its full text. This survey of general aviation requirements was prepared and submitted by the General Aviation Facilities Planning Group, in which eleven national organizations banded together to document the important and growing field of general aviation (as distinguished from airline and military aviation). Special credit goes to them for the report, and to the well-known firm of Booz, Allen & Hamilton, which coordinated and directed the research studies. Part 1 was published last month.

IN presenting the pattern of activity of today's general aviation fleet, we have four general questions to answer: how much flying is done; when is it done; where is it done; and, how is it done? In this chapter the broad picture is developed and more detailed analyses presented in those areas important to the development of facilities requirements.

Total Annual General Aviation Flying

The general aviation fleet flew approximately 10,000,000 hours in 1956. Table 13 presents flying hour estimates by class of aircraft usage. The estimates support the greater usage of aircraft in the business and commercial areas. A similar breakdown of the annual hours flown by class of aircraft is presented in Table 14.

Table 13
FLYING HOURS BY CLASS OF USAGE

Purposes of Flying	Total Annual Hours Flying per Each Purpose
Business transportation	4,600,000
Passenger or cargo for hire	610,000
Patrol and survey	750,000
Nonbusiness	2,100,000
Instruction and miscellaneous	2,020,000
	10,080,000

Source: Aircraft Owners' Survey

Table 14
FLYING HOURS BY CLASS OF AIRCRAFT

Aircraft Class	Number of Aircraft	Average Annual Hours Flown per Aircraft	Total Annual Hours Flown
I	1,630	445	725,000
II	1,525	225	343,000
III	22,545	195	4,392,000
IV	31,623	146	4,620,000
	57,579		10,080,000

Source: Aircraft Owners' Survey

The consistently higher annual hours credited to Class I and II aircraft are in keeping with the earlier figures supporting the greater activity of these aircraft, which are largely engaged in business and commercial activities. Table 15, showing the distribution of annual hours flown by each class of aircraft as reported by the owners or regular pilots of these aircraft, adds documentation to this fact.

Table 15
DISTRIBUTION OF ANNUAL FLYING HOURS BY EACH CLASS OF AIRCRAFT

	Aircraft Class		
	I & II	III	IV
1-50 hrs.	3%	6%	16%
51-150 hrs.	9	41	42
151-500 hrs.	65	45	36
Over 500 hrs.	23	8	6

Source: Aircraft Owners' Survey

The sharp break between the use of Class I and Class II aircraft and those of lower performance is pointed out by the fact that 88% of higher performance aircraft fly more than 150 hours a year, whereas only about half of the lower performance Class III and Class IV aircraft reach this level of activity.

Variation and Peak Loads

The average activity figure is, of course, only of general value. Facility requirements must be based upon the requirements during periods of peak activity.

Seasonal variation: The seasonal variation of flying displays the expected peak periods during the summer months. The variation curve for Classes I and II is somewhat flatter than the curve for Classes III and IV and is, of course, at a much higher level throughout the year.

Based on data derived from different studies and surveys, the average indexes of hours flown per month for the entire country appear about as follows:

	Average	Maximum	Minimum
Classes I and II	241	272	209
Class III	120	156	94
Class IV	105	133	78

Table 16, opposite page, charts the seasonal flying curve by class of aircraft.

It should be noted at this point that there is no significant variation in this seasonal pattern across the various regions of the country. Although the amount of flying per airplane does vary to some extent by regions, cycles are reasonably similar in all areas of the country.

The map shown in Table 17, opposite page, defines the different geographical regions used throughout this report. Table 18 presents the high, medium and low seasonal indexes for each geographical region by aircraft class.

Table 18
COMPARISON OF AMOUNTS OF FLYING AND SEASONAL VARIATIONS BY GEOGRAPHICAL REGIONS
Seasonal Index of Hours Flown Per Month

Region	High	Medium	Low
Class I and II Aircraft			
Western	280	245	200
North Central	225	208	186
Northeastern	250	220	190
Southern	330	295	270
Class III Aircraft			
Western	163	128	97
North Central	165	130	100
Northeastern	130	97	70
Southern	142	118	94
Class IV Aircraft			
Western	160	130	100
North Central	112	85	60
Northeastern	130	110	86
Southern	175	128	88

Source: Aircraft Owners' Survey

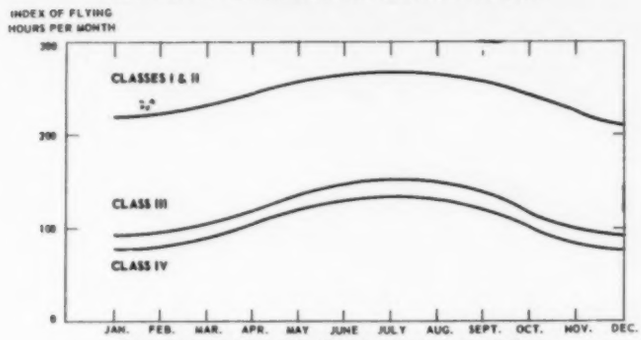
This pattern of seasonality across the regions is further supported by

the airport survey, in which the peak days' activity at airports across the country is found to come in the months of July, August, or September —again with little variation from region to region. This is presented in some detail in Table 19.

Weekly variation: The variation of operations throughout the week is again similar throughout airports of all regions and airports of all sizes. The operating load increases toward the end of the week, with Sunday being the busiest day. Table 20 presents the results of the airport operators' survey and clearly shows this week-end peaking for all classes of airports. It should be pointed out that this chart does not show the magnitude of this peaking, but only that the peak day does fall as shown in this total airport sample.

The relationship of the amount of activity on the least active day of a typical busy week to the peak day provides a measure of the range in activity during a typical busy week. This relationship as illustrated in Table 21, next page, appears to be similar for different airports, regardless of the number of based aircraft. While not shown here, the relationship holds true, regardless of geographical region.

Table 16
SEASONAL VARIATION IN FLYING HOURS



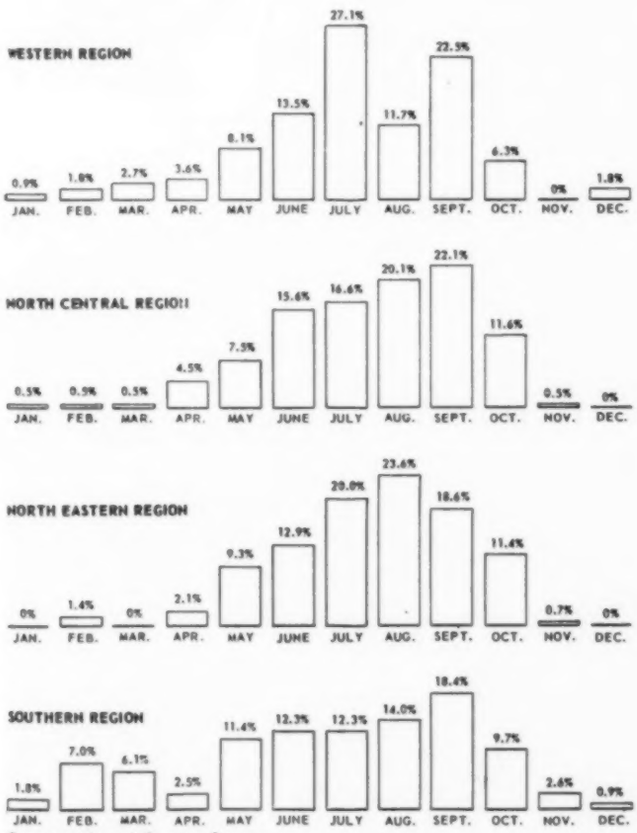
100 equals lowest utilization for fleet as a whole

Table 17
GEOGRAPHICAL REGIONS OF THE UNITED STATES

Source: Aircraft Owners Survey.

Table 19
MONTH IN WHICH ANNUAL PEAK DAY OCCURS

(PERCENT OF REPORTING AIRPORTS BY MONTH)



Source: Airport Owners Survey

Table 20
BUSIEST DAY OF THE WEEK AT AIRPORTS

(PERCENT OF REPORTING AIRPORTS BY DAY OF THE WEEK)

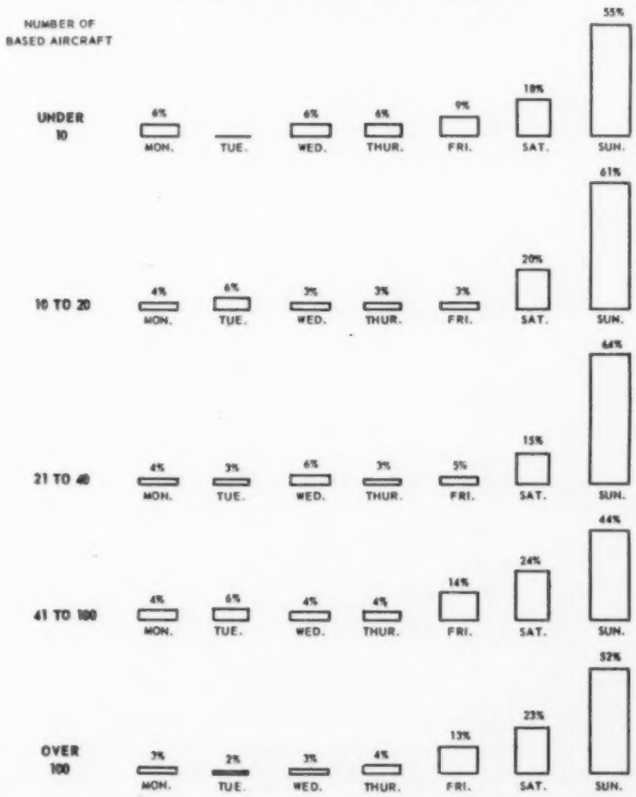


Table 22

PROPORTION OF DAYTIME FLYING BY AIRCRAFT CLASSES

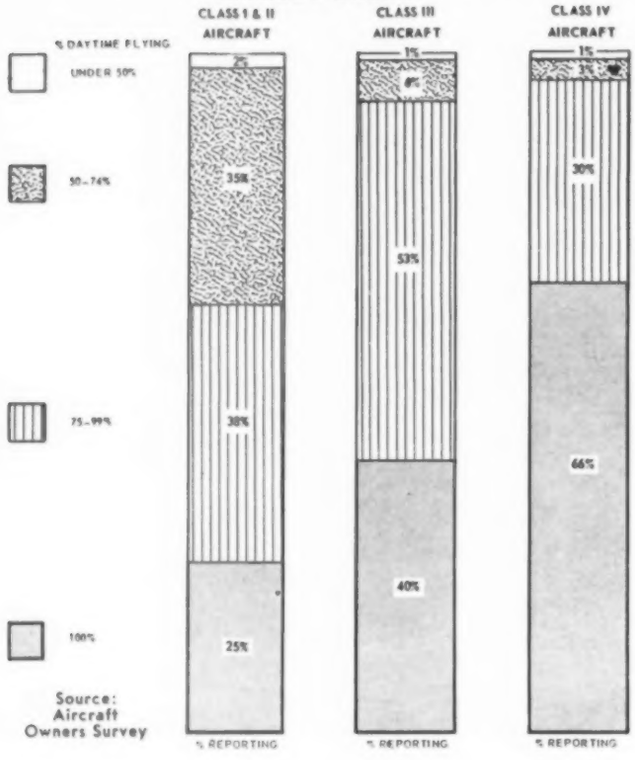


Table 23

PROPORTION OF DAYLIGHT VS NIGHT CROSS-COUNTRY FLYING

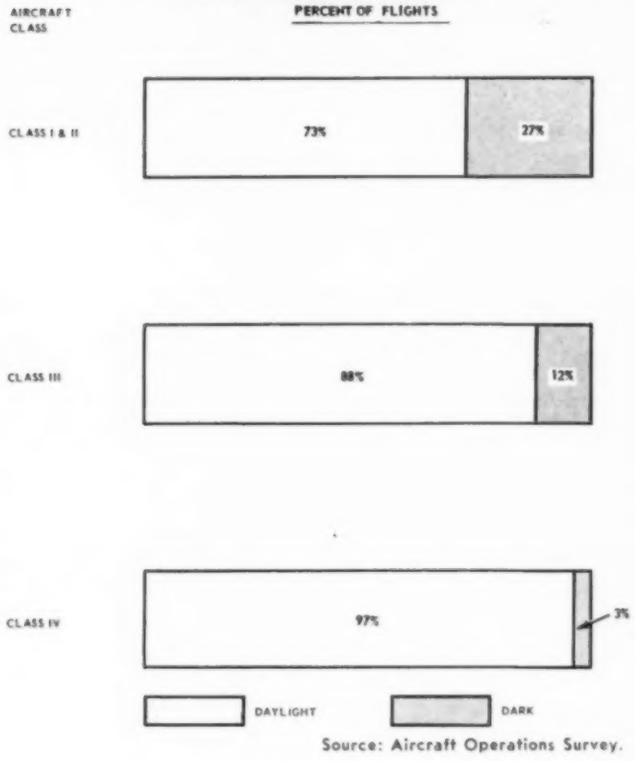


Table 21

RELATIONSHIP OF THE LEAST ACTIVE DAY TO THE PEAK DAY OF A TYPICAL BUSY WEEK

No. of Based Aircraft at Airports Throughout the Country	Per Cent That Low Day Is of Peak Day			
	20%	40%	60%	80%
Under 10	24%	45%	18%	13%
11-20	28	44	22	6
21-40	32	39	26	3
41-100	35	27	22	16
Over 100	22	26	40	12

Source: Airport Operators' Survey

Daily variation: Most general aviation flying is done during daylight hours. Many aircraft owners report that all of their flying is done during the daylight hours, and few of the owners and pilots of Class III and Class IV do a great deal of nighttime flying. This pattern is borne out by the replies to questions put to the owners or their regular pilots, as summarized in Table 22.

During the two-day operations survey, this pattern of daylight flying was particularly demonstrated, with the operating peaks coming in the middle of the day. The actual distribution of operations by hours of the day by class of aircraft is shown in Table 33. Operations by time of day are discussed in detail in a later section of the report.

It can be seen that during the days of the operations' survey, the great majority of all operations took place between sunup and sundown, although those planes arriving or departing after dark did place a measurable load upon nighttime facilities.

It is important to differentiate between operations connected with local flying and those connected with cross-country flying. Even so, it is apparent that the great bulk of cross-country flying is done during daylight hours. This fact is supported by an analysis of the daylight versus night cross-country flying during the two-day survey of Chicago hub operations, as presented in Table 23.

In summary, insofar as the variations are concerned, it can be safely said that the peak load which must be supported by our aviation facilities will occur during the late summer months on a week end during the hours from middle morning to late afternoon.

Operations on Typical Peak Day

As an over-all background for discussion of operating patterns of today's general aircraft fleet, it is useful to have a picture of the nationwide flying activity on a "typical peak day" in the year 1956. "Operations" is defined as either a landing or a takeoff and provides a most direct measurement of airborne activity.

A typical peak day is a day: (1) When weather conditions nationwide are such that they do not effectively prohibit any pilot or plane from taking the air; and (2) during the late summer peak and on the weekly normal peak.

The estimates presented here are derived from the operations survey undertaken in October, 1956, as a part of this study and are adjusted to account for operations which missed being recorded at airports surveyed and for weather conditions. These adjustments to reach the typical peak figure have been checked against airport managers' records where available and with managers' estimates where specific records were unavailable.

Approximately 380,000 operations are generated by general aviation on a typical peak day: These 380,000 estimated peak day operations may be broken down according to the location, in the following manner:

	Number of Operations	Per Cent of Operations
Large hubs	**116,000**	**30%**
Medium and small hubs	**109,000**	**29**
Nonhub airports	**155,000**	**41**
	380,000	**100%**

The selection, classification, and definition of the geographical area of hubs used in this report are the same as those used by the Civil Aeronautics Administration. In general, the CAA definition of the geographical limits of a hub are the same as the metropolitan areas as defined by the Department of Commerce.

A relatively few major hub areas generate the greatest traffic congestion: A map of the country showing the relative densities of operations by hub areas is presented on page 103.

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  Philadelphia, Pennsylvania
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  Wilmington, Delaware

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Table 24
OPERATIONS DENSITY AT 22 LARGER HUBS

½-in. radius equals 20,000 operations on a peak day of a typical busy week.
Source: Aircraft Operations and Airport Operators Surveys.

Table 25
OPERATIONS IN CHICAGO HUB — FRIDAY VERSUS SATURDAY
Recorded Operations During Two-Day Survey of 28 Chicago Hub Airports

Aircraft Class	LOCAL: In Vinicity of Airport	LOCAL: Longer Distance	LOCAL: Within Hub	CROSS-COUNTRY: Less Than 100 Miles	CROSS-COUNTRY: 101-200 Miles	CROSS-COUNTRY: 201-400 Miles	CROSS-COUNTRY: Over 400 Miles	Total
FRIDAY								
I	22	6	20	27	23	24	30	152
II	0	0	4	9	11	3	9	36
III	1,086	46	124	96	70	43	17	1,482
IV	1,672	28	44	34	12	5	0	1,795
Total	2,780	80	192	166	116	75	56	3,465
SATURDAY								
I	2	2	12	43	12	14	7	92
II	2	0	6	13	7	4	2	34
III	2,323	120	224	168	104	55	12	3,006
IV	3,384	116	130	117	41	9	1	3,798
Total	5,711	238	372	341	164	82	22	6,930

Source: Aircraft Operations Survey

This map emphasizes the magnitude of operations generated in the 22 large hubs—the size of the circles indicative of the volume of typical peak day operations.

It is worth noting that each of 17 of these 22 large hubs generates as much or more traffic as does the entire state of Wyoming, which generates an estimated 2,350 on a typical peak day.

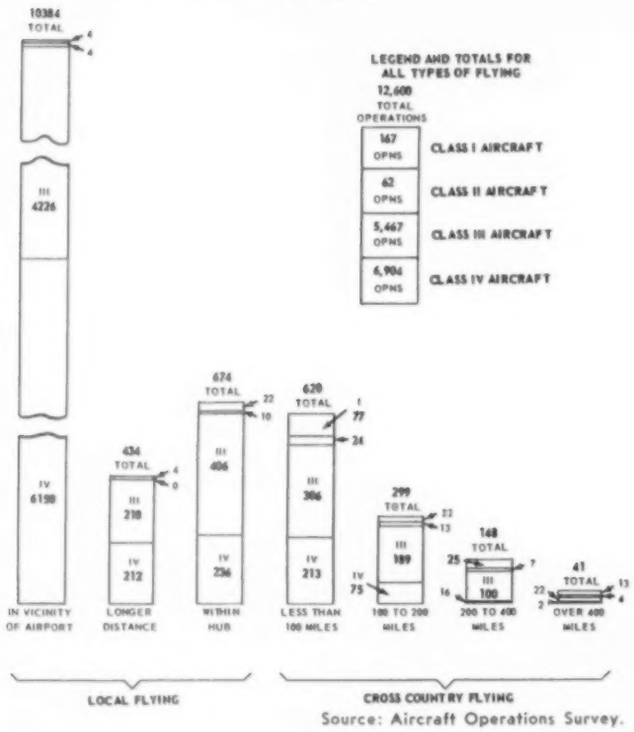
Analysis of Hub Area Flying

An understanding of the general aviation flying patterns within a large hub area is perhaps best gained by a detailed analysis of activities within the Chicago hub area on the days of Friday, October 26, and Saturday, October 27. The Chicago hub area is selected as a specific area for study since: It is one of the largest hubs and has a representative mix of aircraft and air-borne activities; it enjoyed excellent weather during the two days of the operations survey; the data obtained are most complete and the volume provides good statistical significance.

The Chicago hub, as defined by the Civil Aeronautics Administration, covers a large geographical area and includes many airports. More than one half of these airports have less than ten based aircraft, are small and relatively inactive, and were excluded from this survey. All of the Chicago hub airports, with more than ten based aircraft, were included in the survey of these airports: Two have between 10 and 20 based aircraft; six have between 20 and 40 based aircraft; fourteen have between 40 and 100 based aircraft; and five have over 100 based aircraft (these vary from DuPage County airport with 105 based aircraft to Palwaukee with approximately 275 based aircraft).

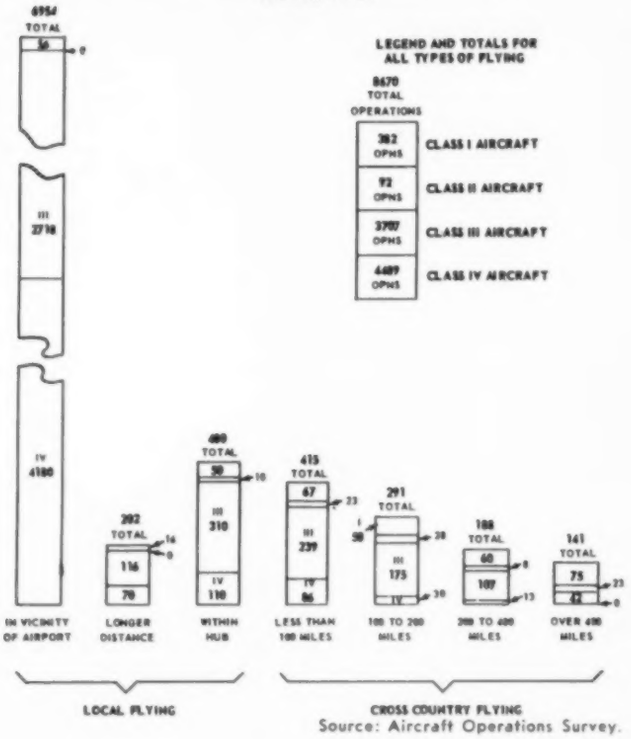
In this airport complex, three airports have peculiar characteristics. Midway and O'Hare, serving the scheduled airlines, generate almost no local flying of a general aviation nature, although a fair amount of cross-country general aviation flying is generated. Meigs Field is a unique airport in that it has few based aircraft and serves transient civil aircraft almost entirely. There is almost no local flying around Meigs (take-off and landing at same field); there is some traffic in and out of Meigs to other airports in the Chicago hub

Table 26
ESTIMATE OF CHICAGO HUB OPERATIONS ON THE BUSIEST WEEKEND DAY OF A TYPICAL BUSY WEEK, 1956



Source: Aircraft Operations Survey.

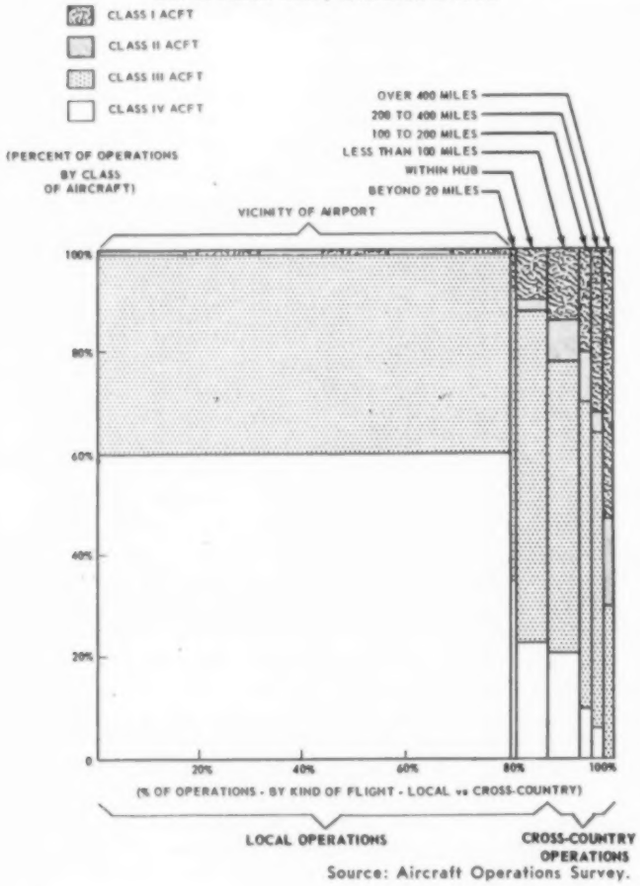
Table 27
ESTIMATE OF CHICAGO HUB OPERATIONS ON THE BUSIEST WEEKDAY OF A TYPICAL BUSY WEEK, 1956



Source: Aircraft Operations Survey.

area; and there is a considerable amount of longer distance cross-country flying in and out of Meigs. The general aviation operations at these three airports are included in the Chicago area operations sample.

Table 28
ANALYSIS OF LOCAL AND CROSS-COUNTRY OPERATIONS ON A PEAK DAY, CHICAGO HUB



Source: Aircraft Operations Survey.

Hub operations data show a high proportion of local flying: The raw data are highly instructive in presenting the pattern of operations within the Chicago area. Table 25 presents the raw data obtained during the two-day survey broken down by class of aircraft and by type of flight associated with the operations.

Local flying is broken into three categories: Those essentially in the traffic pattern of the airport; those flights originating and terminating at the airport but going beyond the area of the airport, and those flights going to or coming from another airport within the Chicago hub. Cross-country flying is presented on the basis of distance to the next landing or from the take-off airport.

Extending these data to all operations in the Chicago hub area on a typical normal peak condition, we arrive at an estimated 8,670 operations on a peak weekday (Friday) and 12,600 operations on a peak week-end day (Sunday). The breakdown of these operations by class of aircraft and type of flight associated with the operations is given in Tables 26 and 27.

The predominant pattern is immediately observable from these data. The great majority of airport operations within a hub area are associated with local flights within the hub. As would be expected, the predominance of this local flying increases in the lower performance categories of aircraft, while cross-country flying is increasingly the role of the higher performance aircraft as the flight distances become greater.

Table 28 gives a vivid presentation of this pattern in the area chart.

The class of airport apparently has no great significance in the generation of local flights versus cross-country flights: Table 29 analyzes local versus cross-country operations for each class of airport. For analysis purposes, Meigs Field is assigned to the category of airports having over 100 based aircraft. It is apparent that regardless of their class, there is no great difference be-

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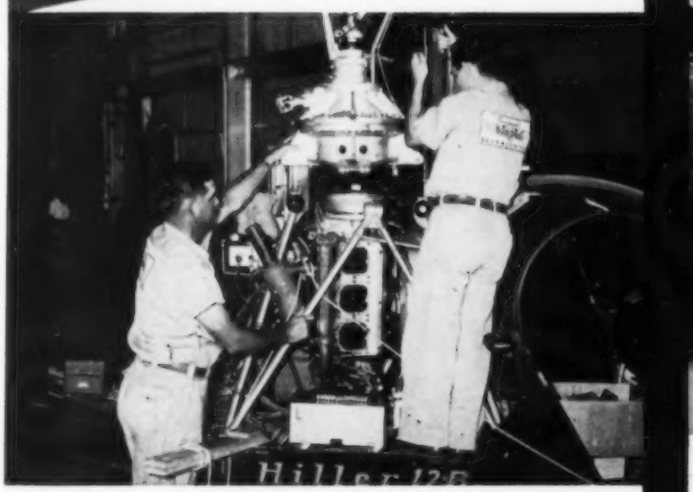

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Table 29

LOCAL VERSUS CROSS-COUNTRY FLYING BY CLASS OF AIRPORT CHICAGO HUB

No. of Based Aircraft at Airports	No. of Airports	Per Cent of Local Operations at all Airports in Each Group	Per Cent of Cross-Country Operations at all Airports in Each Group
10-20	2	2%	3%
21-40	6	10	10
41-100	14	46	36
Over 100	6*	42	51
	28	100%	100%

Source: Aircraft Operations Survey
Airport Operators' Survey
*Includes Meigs Field

Table 30

LOCAL VERSUS CROSS-COUNTRY FLYING BY AIRCRAFT CLASS AND BY AIRPORT CLASS CHICAGO HUB

	NUMBER OF BASED AIRCRAFT AT AIRPORTS				
	10-20	21-40	41-100	Over 100	Total
Number of Airports	2	6	14	6*	28
Class I Aircraft:					
Local (%)	—	12	50	38	100
Cross-Country (%)	—	2	40	58	100
Class II Aircraft:					
Local (%)	—	—	50	50	100
Cross-Country (%)	—	—	6	94	100
Class III Aircraft:					
Local (%)	3	14	39	44	100
Cross-Country (%)	2	11	33	54	100
Class IV Aircraft:					
Local (%)	3	14	46	37	100
Cross-Country (%)	2	12	32	54	100

Source: Aircraft Operations Survey — Airport Operations Survey.
*Includes Meigs Field

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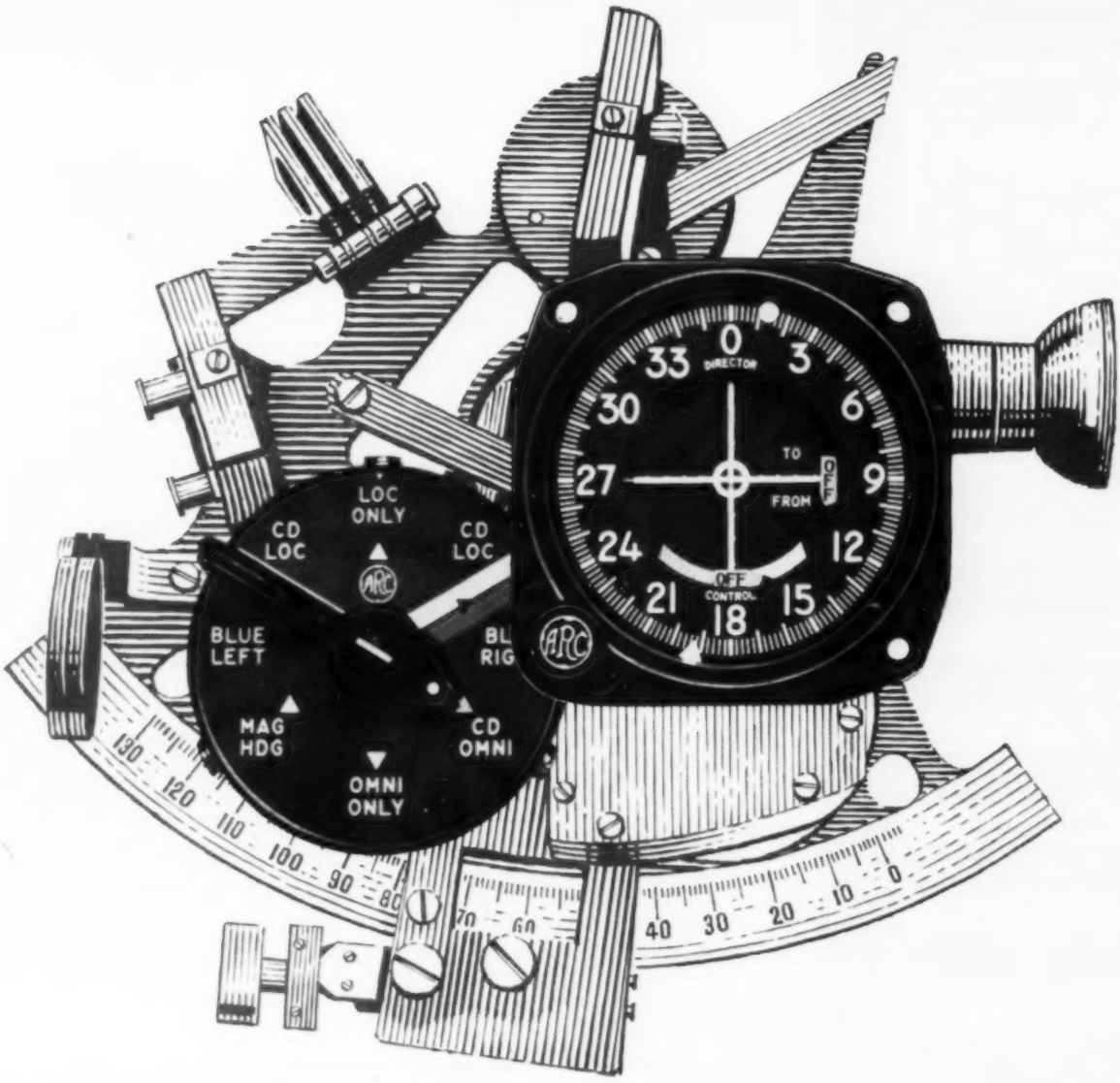
tween the contributions by each airport class to operations associated with local flying or operations associated with cross-country flying.

Classes of aircraft show a similar distribution of local versus cross-country flying regardless of airport: An extension of the analysis in the previous section to activity by aircraft classes apparently further demonstrates the fact that the amount of local or cross-country flying by each class of aircraft continues to be independent of the class of airport from which the aircraft operates. It seems that if the airport is able to accommodate the aircraft at all, the use of those aircraft which it does accommodate fits the total area pattern. Table 30 presents the summary of this analysis.

It should be noted, and expected, that the airports having fewer based aircraft (and, generally speaking, these are the smaller airports) exclude the operation of Class I and Class II aircraft simply because their facilities cannot accommodate these higher performance planes with ease. The remarkable similarity in the patterns of Class III and Class IV operations is clear. Again, the general conclusion must be drawn that the probability of a flight being either local or cross-country is roughly consistent with the probability for that total class of aircraft regardless of the class of airport from which it is operating.

No significant trends of flight distances by airport class appear: An analysis of the flights associated with the surveyed operations by flight distance, for cross-country flights only, indicate that each class of airport stages or receives cross-country flights of all distances. The sole exception to this generalization is the slightly increased flight distances associated with cross-country operations out of the larger airports, which increase is attributable to the Class I and Class II planes which are barred by performance from the smaller airports and



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BEST ALL-ROUND STABILITY IN ITS CLASS!

...with Land-O-Matic* landing gear...tapered high wing... 57 other exclusive features in the big new '57 Cessna 172

*the feature that's revolutionizing flying.

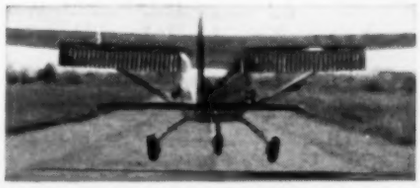
More and more pilots are proving it: the big Cessna 172 is easier, more stable and comfortable to fly . . . does have dozens of extra features not found in any other low-priced plane! That's why it quickly became the largest-selling airplane!

From its smooth 145-H.P. 6-cylinder Continental engine, world record holder for endurance flight . . . through its larger, more-handsomely appointed cabin . . . to its Land-O-Matic landing gear that shrugs off shocks from short, rough landings and take-offs . . . here is an airplane so far ahead of its class you must see and fly it yourself to fully appreciate its value! And a Cessna 172 (with std. equip.) is priced at just $8,975 . . . f.a.f. Wichita.

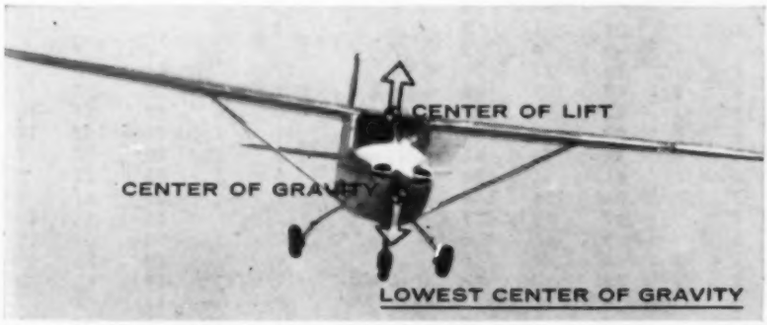
So get proof—in flight today from your nearby Cessna dealer (Yellow Pages of phone book) or write: CESSNA AIRCRAFT CO., DEPT. FM-8, Wichita, Kans.

Inquire about Cessna lease plans

Cessna



MOST FLAP IN ITS CLASS! Cessna's 120%-larger Para-Lift flaps give shorter take-off runs, slower and smoother approaches, actually float you down twice as gently as a man in a parachute. And they're exclusive to the Cessna 172 in the low-priced field.



TRUE HIGH-WING STABILITY with a bigger, high-lift wing and a lower center of gravity than any other plane in the low-priced field! You do less trimming, compensating in flight—enjoy a "big-plane feel."

RUGGED ALL-METAL CONSTRUCTION. It's even shotgun-tough, as shown in these unretouched photos! Stays just as tough after years of service! And the Cessna 172 is the only all-metal airplane priced so low. Inside, too, you find quality through and through—newly designed luxury interiors for '57, far more baggage capacity, and the fullest windshield visibility in its class.

4 GREAT CESSNAS 172 180 182 310 THE COMPLETE AIR FLEET FOR EVERY BUSINESS NEED

Table 31
DISTANCE OF CROSS-COUNTRY FLIGHTS BY CLASS OF AIRPORT

No. of Based Aircraft	Flight Distance Under 100 Miles	100-200 Miles	201-400 Miles	Over 400 Miles
10-20	4%	5%	1%	0%
21-40	12	11	12	7
41-100	36	34	41	41
Over 100	48	50	46	52
	100%	100%	100%	100%
	Under 100 Miles	100-200 Miles	201-400 Miles	Over 400 Miles
10-20	63%	33%	4%	0%
21-40	58	25	14	3
41-100	56	24	16	4
Over 100	57	26	13	4
	100%	100%	100%	100%

Source: Aircraft Operations Survey
Airport Operators' Survey

Table 32A
DENSITY OF FLYING ON A WEEKDAY IN THE CHICAGO HUB AIRSPACE
(Local Flying)

Estimated Planes in the Air on a Typical Peak Weekday By Aircraft Class

Time	I	II	III	IV	Total
1 a.m.			3		3
2			1	1	2
3			3		3
4			2	2	4
5					0
6				1	1
7			4	3	7
8			7	17	24
9			22	28	50
10	2	1	34	40	77
11		2	34	37	73
Noon		1	16	18	35
1 p.m.			31	42	73
2			51	33	84
3			49	58	107
4			39	43	82
5			31	25	56
6			8	4	12
7			2		2
8	1			1	2
9				2	2
10					0
11					0
Midnight			5	11	16
Total	3	4	342	366	715

Source: Aircraft Operations Survey

Table 32B
DENSITY OF FLYING ON A WEEKDAY IN THE CHICAGO HUB AIRSPACE
(Cross-Country Flying)

Estimated Planes in the Air on a Typical Peak Weekday By Aircraft Class

Time	I	II	III	IV	Total
1 a.m.			1		1
2				1	1
3	1		2		3
4					0
5			1	2	3
6	1		1		2
7		1	1	1	2
8	4		6	4	14
9	4	4	20	15	43
10	11	2	28	19	60
11	6	5	43	24	78
Noon	6	3	16	16	41
1 p.m.	3	1	30	13	47
2	3		30	23	57
3	1		43	26	70
4	2		20	22	54
5	5	1	33	24	63
6	6	1	11	8	26
7	5		6	1	12
8	2		4	2	8
9			1	2	3
10			1	2	3
11			1	1	2
Midnight	2		11	1	14
Total	62	17	320	207	606

Source: Aircraft Operations Survey

which aircraft have a greater flight distance capacity. Table 31 presents the summary of this analysis.

The stated purpose of flight shows approximately the same pattern in all airport classes: A detailed analysis of the operations during the survey shows that the purpose of flight pattern (business transportation, commercial, pleasure, instruction, etc.) varies little with class of airport.

The series of analyses of activity by airport class, summarized in the foregoing sections, apparently demonstrates that the prime factor of difference between airports is simply—can the aircraft itself be accommodated by the airport? If an airport provides the physical facilities and the services that are essential to the operations of aircraft, we can be relatively sure that the pattern of usage and purpose of usage of aircraft based at that airport will remain relatively true to the over-all patterns of that class of aircraft.

Peak activity within the hub occurs between the hours of 1 p. m. and 5 p. m.

The number of planes in the air in the Chicago hub area by hours of the day during a weekday peak is estimated and presented in Tables 32A, 32B and 32C. A similar estimate of the planes in the air during any given hour on a typical busiest week-end day (Sunday) is shown in Tables 33A, 33B and 33C, following Table 32C. Table 34, page 112, reduces these figures to an index basis against a norm of 100.

Table 32C
DENSITY OF FLYING ON A WEEKDAY IN THE CHICAGO HUB AIRSPACE
(Total Local and Cross-Country Flying)

Estimated Planes in the Air on a Typical Peak Weekday By Aircraft Class

Time	I	II	III	IV	Total
1 a.m.			4		4
2			1	2	3
3	1		5		6
4			2	2	4
5					0
6	1		1	1	3
7			5	4	9
8	4		13	21	38
9	4	4	42	43	93
10	13	3	62	59	137
11	6	7	77	61	151
Noon	6	4	32	34	76
1 p.m.	3	1	61	55	120
2	3		81	56	140
3	1		92	84	177
4	2		69	65	136
5	5	1	64	49	119
6	6	1	19	12	38
7	5		8	1	14
8	3		4	3	10
9			1	4	5
10			1	2	3
11			1	1	2
Midnight	2		16	12	30
Total	65	21	661	571	1,318

Source: Aircraft Operations Survey

Taken in total, these data clearly demonstrate that general aviation flying in 1956 was basically an 8 a.m. to 8 p.m. affair with the peaks—whether on Friday, the busiest weekday, or on Sunday, with all of the "Sunday fliers"—coming at about 3 p.m.

As would be expected, the peaking tendency is somewhat more pronounced with Class III and IV aircraft, which are generally privately piloted and do the major share of the local flying. Class I and Class II aircraft do not present such a peaking

Table 33A
DENSITY OF FLYING ON SUNDAY IN THE CHICAGO HUB AIRSPACE
(Local Flying)

Estimated Planes in the Air on a Typical Busy Sunday By Aircraft Class

Time	I	II	III	IV	Total
1 a.m.			5		5
2			2	2	4
3			5		5
4			4	4	8
5					0
6				2	2
7			7	5	12
8			13	30	43
9			39	50	89
10	4	2	60	71	137
11		4	60	66	130
Noon		2	28	32	62
1 p.m.			55	74	129
2			90	58	148
3			87	103	190
4			69	76	145
5			55	44	99
6			15	7	22
7			4		4
8	2			2	4
9				4	4
10					0
11					0
Midnight			1		1
Total	6	8	599	630	1,243

Source: Aircraft Operations Survey

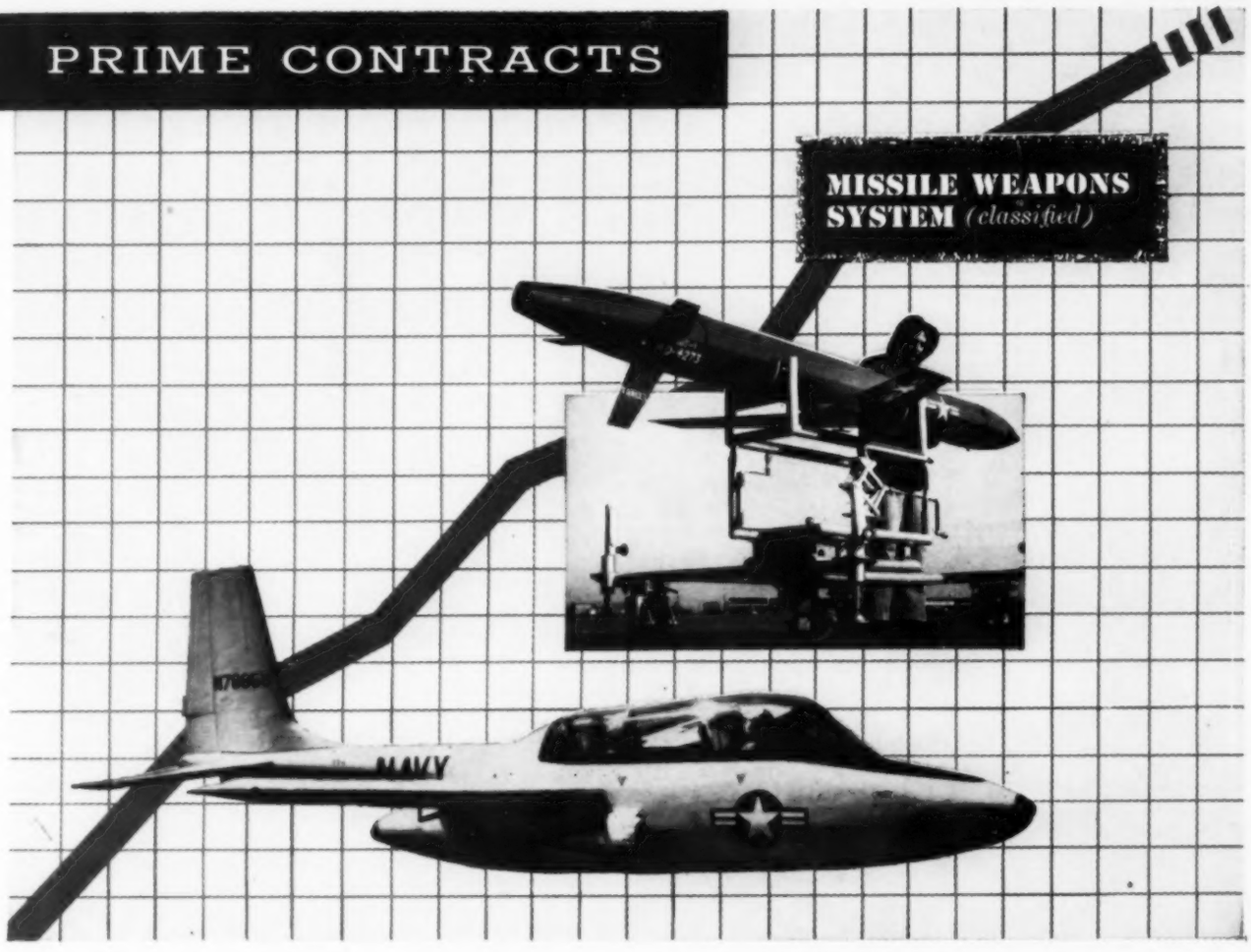
Table 33B
DENSITY OF FLYING ON SUNDAY IN THE CHICAGO HUB AIRSPACE
(Cross-Country Flying)

Estimated Planes in the Air on a Typical Busy Sunday By Aircraft Class

Time	I	II	III	IV	Total
1 a.m.			2		2
2				2	2
3	2		4		6
4					0
5			2	4	6
6	2		2		4
7			2	2	4
8	7		11	7	25
9	7	7	35	27	76
10	19	4	50	34	107
11	11	9	76	43	139
Noon	11	5	28	28	72
1 p.m.	5	2	53	23	83
2	5		53	41	99
3	2		76	46	124
4	4		53	39	96
5	9	2	58	43	112
6	11	2	19	15	47
7	9		11	2	22
8	4		7	4	15
9			2	4	6
10			2	4	6
11			2	2	4
Midnight			3	1	4
Total	108	31	551	371	1,061

Source: Aircraft Operations Survey

PRIME CONTRACTS



At Temco GROWTH tells the story

Growth — in prime contracts earned, for example, tells the Temco success story.

In January, Temco announced its third prime contract from the U. S. Navy within a seven-month period. This 16-million-dollar order, for a classified guided missile weapons system, is another Temco engineering accomplishment, another advance in the company's rapid growth as a prime contractor.

In June 1956, the Navy selected Temco's TT-1 jet aircraft to become the nation's first primary jet trainer. Just six months later, the Navy ordered the Temco rocket-powered XKDT-1 rocket-powered missile target.

These significant events cap eleven years of sturdy growth at Temco. Together with other aircraft, missiles and weapons systems now in development, these prime contracts are building Temco's prominent position in America's aircraft industry. For the engineer who seeks a truly rewarding career, they spell out a story of challenging opportunity.

Mr. Joe Russell, Engineering Personnel
Room 107-D, Temco Aircraft Corp., Dallas, Texas

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tendency. But even these planes do a minimum of night flying. In analyzing the reasons for the amount of night flying, it is difficult to appraise the impact of such factors as the business-man's desire to be home at a normal hour, the safety considerations, and the availability of night flying facilities.

Table 33C
DENSITY OF FLYING ON SUNDAY IN THE CHICAGO HUB AIRSPACE
(Total Local and Cross-Country Flying)

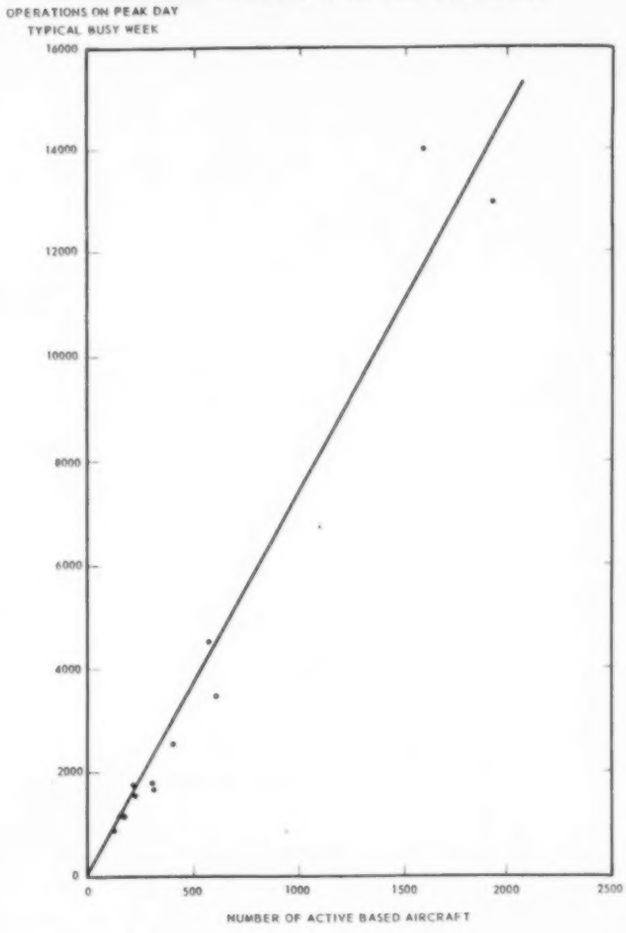
	Estimated Planes in the Air on a Typical Busy Sunday By Aircraft Class				
Time	I	II	III	IV	Total
1 a.m.			7		7
2			2	4	6
3	2		9		11
4			4	4	8
5			2	4	6
6	2		2	2	6
7			9	7	16
8	7		24	37	68
9	7	7	74	77	165
10	23	6	110	105	244
11	11	13	136	109	269
Noon	11	7	56	60	134
1 p.m.	5	2	108	97	212
2	5		143	99	247
3	2		163	149	314
4	4		122	115	241
5	9	2	113	87	211
6	11	2	34	22	69
7	9		15	2	26
8	6		7	6	19
9			2	8	10
10			2	4	6
11			2	2	4
Midnight			4	1	5
Total	114	39	1,174	1,020	2,304

Source: Aircraft Operations Survey

A similarity of operations patterns exists across hubs: The usefulness of an intensive analysis of Chicago hub area operations is predicated upon the assumption that the general pattern of operations across all hubs is similar. While some variations do exist from hub to hub, based upon geographical and population distribution peculiarities, the essential pattern of activities is similar enough so that an extension of the Chicago area analysis can provide us, through extension, with a good general breakdown of general aviation operations across all hubs.

The peak patterns of aircraft operation across hubs present a relatively good correlation between the number of peak day operations and the number of aircraft based at all airports within the hub. This correlation for 11 major hubs enjoying non-prohibitive weather during the two days of the survey is shown in Table 35.

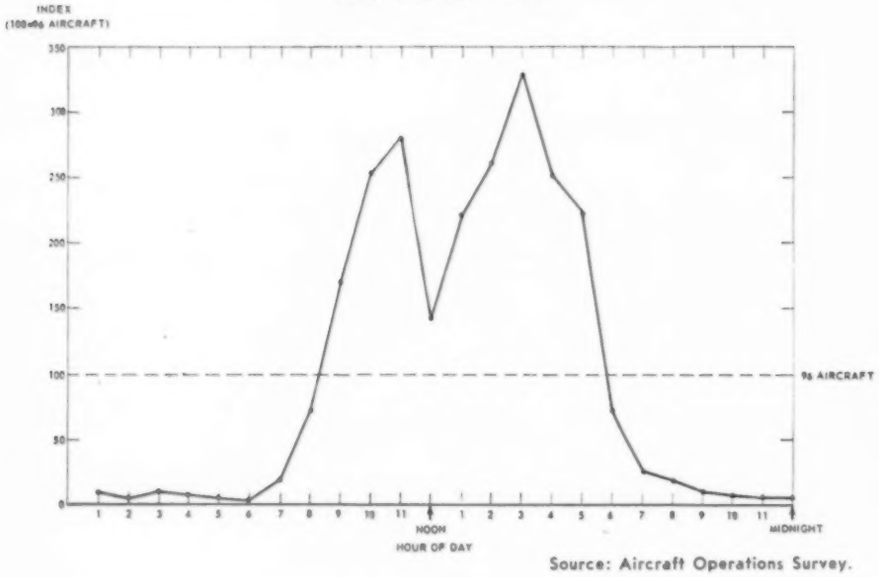
Table 35
CORRELATION BETWEEN PEAK DAY OPERATIONS AND ACTIVE BASED AIRCRAFT AT SELECTED HUBS



Assuming that this correlation continues with all other hubs, we have a useful tool for projecting normal peak day operations under good weather conditions for all hubs across the country. The ratio of local versus cross-country operations in these selected hubs also falls within relatively limited ranges, as shown in Table 36. Although there is a variation from hub to hub, generally speaking, it appears that approximately nine out of ten operations within a hub on a peak good weather day are local whereas about 1 in 10 are cross-country.

In this section we have devoted most of our attention to the local character of most of the flight operations within a major hub area. These are the operations which pose the major good weather traffic control and facilities requirements. (To be continued next month.)

Table 34
ACTIVITY IN THE CHICAGO HUB AIRSPACE DURING A TYPICAL PEAK WEEKEND DAY



Source: Aircraft Operations Survey.

Table 36
LOCAL VERSUS CROSS-COUNTRY OPERATIONS AT SELECTED HUBS

	Operations on Peak Days of a Typical Busy Week	
	Local	Cross-Country
Chicago	90%	10%
Dallas	85	15
Fort Worth	86	14
San Francisco	85	15
Kansas City	90	10
San Diego	95	5
Tulsa	87	13
Miami	94	6
San Antonio	93	7
Des Moines	80	20
Range	80%-95%	5%-20%

Source: Aircraft Operations Survey
Airport Operators' Survey

CARAVELLE TRIP

(Continued from page 95)

powered airliners and a wide pattern was flown at much slower speeds before the Caravelle was brought in over the fence at about 125 knots for a landing at 95 knots (110 mph.), wheel brakes easing the Caravelle to a stop within 3,500 ft. from touchdown.

Our trip from Miami for the 1,000-mile distance can be summarized as follows:

Miami taxi, 5 mins., 54 gals.
Take-off and climb to 31,000 ft. 43 mins., 840 gals.
Cruise at 31,000 ft. 1 hr. 44 mins., 1,268 gals.
Letdown and land 17 mins., 106 gals.
Houston taxi 5 mins., 50 gals.

Ramp to ramp totals: Time, 2 hrs. 44 mins.; fuel used 2,318 gals.; average fuel consumption, 800 gals. per hr.; average speed, ramp to ramp, 345 mph.

The Caravelle made its first flight in May, 1955, and the first two prototypes have since flown a combined total of some 1,500 hours, covering mileage equivalent to about 30 trips around the world. It was designed to American CAA air transport licensing requirements and incorporates numerous American equipments, including Bendix, AiResearch Cabin pressurization and a new transistorized air transport autopilot developed by Lear. In addition it features British power in its Rolls-Royce engines and its nose and cockpit section are from the de Havilland Comet jet airliner.

Cabin pressurization is at a maximum of 8.25 lbs. per sq. in., which provides for sea level cabin pressure up to a cruising altitude of 20,000 ft. and a cabin altitude of only 5,500 ft. while cruising at 31,000 ft., and an 8,200-ft. cabin at 40,000-ft. altitude. Design safeguards for this relatively high degree of pressurization were based on most recent British experiences in perfecting the Comet.

The Caravelle was designed for economical airline operation on hops ranging from 250 to 2,000 miles, its performance enabling it to use existing airports having 6,000-ft. runways. Take-off run at 90,400 lbs. gross with Rolls-Royce R. A. 26 Avon jets of 10,000 lbs. thrust is 3,600 ft. This is at a take-off speed of 120 knots. One-engine-out critical take-off speed is 114 knots and accelerate-stop distance is 5,580 ft. At a landing weight of 86,000 lbs., only 3,740 ft. is required to land from a 50-ft. height. Single-engine rate of climb at sea level and gross weight is said to be more than 500 fpm. and the Caravelle has actually demonstrated in France that it can take off on one engine from a standing start in 6,500 ft. This performance is for the prototype.

Air France has ordered twelve Caravelles and has an option for twelve more. Deliveries begin in 1958. Meanwhile, several thousand guests will be hopped in the Caravelle on its extended American tour, including stops at New York, Baltimore, Washington, Miami, Atlanta, Houston, Dallas, Kansas City, St. Louis, Chicago, Denver, Salt Lake City, Los Angeles, San Francisco, Seattle and Montreal. Most of these guests are aircraft industry and airline people. In charge are Brig. Gen. Claude Teyssier, U. S. representative of Sud Aviation; Don Parker, foreign liaison officer for Republic Aviation, and Ted Wayne of Montreal, Rolls-Royce sales representative. The Caravelle was flown across the South Atlantic for the tour and on May 21 had logged 81 hrs. 46 minutes from Paris, having carried 1,419 guests at that time and having averaged 442 mph. for cruising speed. It became the first jet cleared by noise-sensitive New York Port Authority officials to operate from Idlewild International Airport. ★ ★ ★

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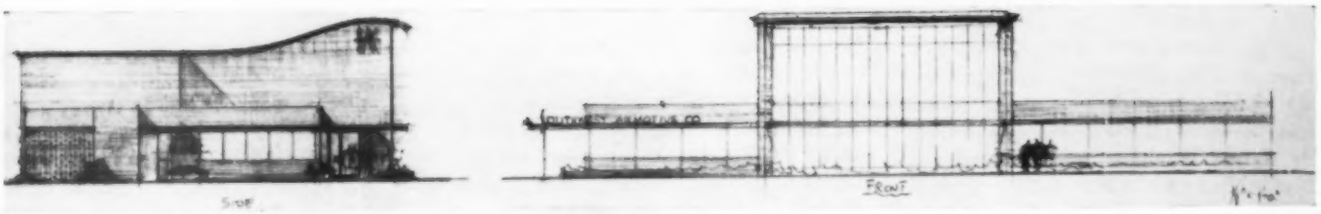

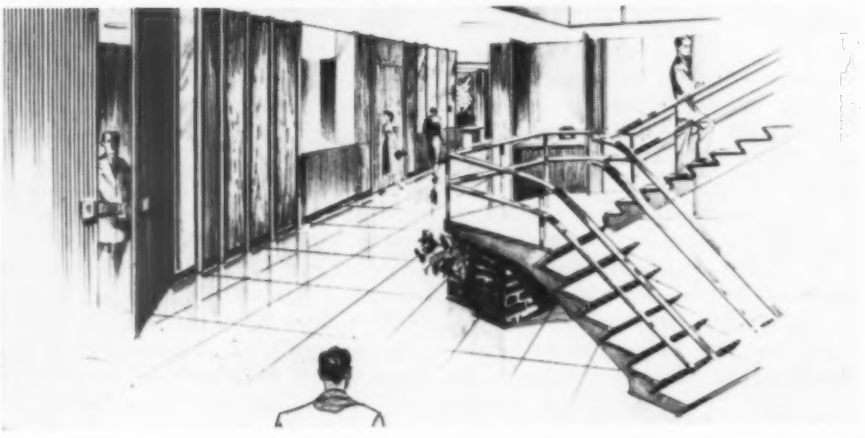

Side and front views of Southwest Airmotive's plush new business flying terminal are shown above. At left are views in its club-like dining room (center) and main lobby (bottom).

NATIONWIDE ROUNDUP:

New Business In the Hangar

SOUTHWEST AIRMOTIVE in Dallas has released architectural sketches of its new Love Field business flying terminal, as large, plush and complete as many airline terminals. Adjoining an 800-ft., 4-unit hangar, the air-conditioned two-story business flying terminal is 126 ft. wide and has 12,000 sq. ft. of floor space. The main lobby will be 45 ft. wide and 39 ft. long. Off the lobby

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The Marines' XROE-1 collapsible Rotorcycle

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will be flight operations offices, pilots' lockers and dressing room, executive offices, restrooms and sales counters. Restaurant and lounge areas are upstairs, with a 17-ft. high Solex glass wall overlooking the runways. In addition to a 100-person section which can be isolated by folding doors for private meetings, a 20-seat coffee shop is also provided. Fine foods for restaurant dining and box lunches for in-flight serving will be featured. Southwest officials say nothing will be spared to make this the most luxurious business flying terminal in the world. It will open this summer and is part of a new $4,000,000 facility the firm is constructing across the runways from its old site, where a new airline terminal is being erected. In addition to its business flying terminal, Southwest has leased the airport's old municipal airline terminal and will headquarter its distributor sales department there, where non-sched and cargo airlines will be serviced.

HORTON & HORTON CUSTOM WORKS at Fort Worth became the first to use U. S. Rubber's "Flair" headlining and Soji butterfly slide-screens in lieu of fabric draperies when they installed a new coral, off-white and charcoal interior last month in Lodestar N300E of Fred Ayer, the Linden (N. J.) aviation trader. N300E was shown at the June 1 Reading Air Show. Other interesting H & H jobs last month included interiors for 4-place Bell 47J helicopters going to President Eisenhower, the president of Colombia, South America, Arthur Vining Davis of Florida, Northrop President Whitley Collins, Burlington Industries of Greenville, N. C., and the New York Police Department.... Pfeiffer Brewing's Detroit-based Lodestar sports a new H & H cleanable interior in bluebonnet blue and eggshell, with featherweight plastic simulated-wood panelling and driftwood oak Formica card tables. William Hafner is chief pilot. Bill White, Brown Aero vice president of Dallas, chose a chestnut off-white color scheme with hand-printed imported linen draperies for their new H & H Aero Commander interior.

REMMERT-WERNER at St. Louis sold another deluxe Super-92 DC-3 last month, this one going to a private individual who specified an A-12 autopilot, radar and full radio. May was one of the firm's busiest months but all the activity was routine engine changes, 100-hr. inspections and annual relicenses, no one job being unusual.

Meanwhile, Remmert-Werner announced acquisition of the engine shop portion of Page Aircraft Industries at Cimarron Field, Oklahoma City. R-W will probably concentrate on airline and military engine overhaul there, specializing on Pratt & Whitney and Wright overhauls. It will be known as Remmert-Werner, Inc. of Oklahoma, and all present

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Left to right are F. H. Isaacks, Manager of Cameron's Southern Louisiana Division; Roy Davis, Domestic Sales Manager, and Herbert Allen, Vice President and General Manager of Cameron Iron Works, Inc.

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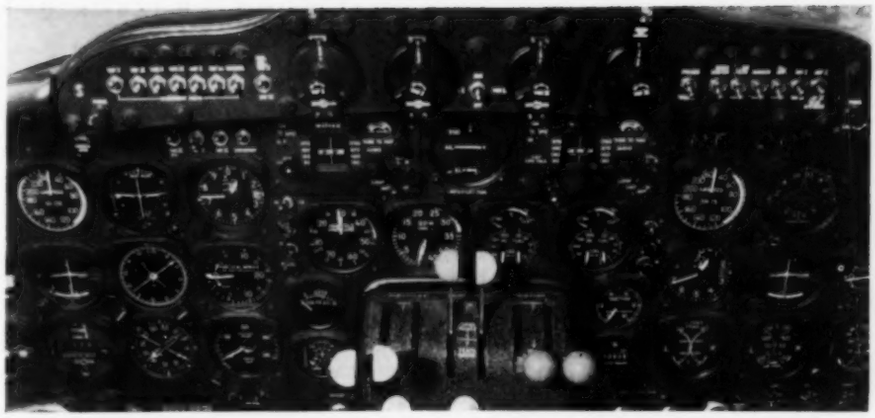
Page employees are being retained. Facilities will be added for engine changes, too, and the new base will probably be expanded to handle aircraft overhauls as the same type of operation as R-W bases at St. Louis, Toledo and Pompano Beach, Florida.

The Garrett Corporation's AIRESEARCH AVIATION SERVICE DIVISION, Los Angeles International Airport, has received General Petroleum's DC-3, for which Arch McGregor, new to GP, is pilot, and Jim Hall is co-pilot. Extensive work is being done to the ship, including a complete exterior paint job, control surface recovering, new instrument panel and a Sierracin one-piece electrically-heated windshield. Its engines will be changed from Dash 92's to Dash 94's, and other work includes miscellaneous radio and AiResearch rudder modification permitting 1,350-hp. utilization for take-off.

Other AiResearch activities last month: Axelson Manufacturing brought in its DC-3 for aileron and rudder recovering and 100-hr. inspection. Angelo Pappas is pilot.... The Garrett "Green Hornet" DC-3 now has the best visibility of any DC-3 in the air—AiResearch installed an extra 1,200 sq. ins. of glass above the pilot's compartment. The new overhead section consists of three separate panels, each consisting of about 400 sq. ins. The center panel, which is almost flat, doubles as an escape hatch. This and other changes were made while the DC-3 underwent an 8,000-hr. overhaul, virtually being remanufactured. Jack Womack is chief pilot.... Work is under way on installation of an AiResearch GTP70-10 gas turbine power unit for a CAA Convair 440 out of Washington, D. C. It will be the first such turbine in a 440, which will also have an AiResearch RCA AVQ-10 radar installation featuring two indicators, one up front and the other in the main cabin. AiResearch recently completed engineering for a GTP70-10 turbine as an auxiliary power unit in a Navy R4Y Convair 440 at Pt. Mugu, Calif., the Navy doing the installation. . . . Eight AiResearch-designed berthable divans are going in three Convair 440's, two owned by Union Oil and one owned by Gulf.

WHAT THE WELL-EQUIPPED SUPER AERO COMMANDER 680 should carry for dependable IFR company schedules into high density airports is seen in the photo on page 117, which shows the panel designed by John P. Meyers, chief pilot of the Hubinger Company, Keokuk, Iowa, for their new 680 Commander. Installation was by Minnesota Airmotive at Minneapolis. A Collins integrated flight system and Collins AP-101 autopilot reduce en route navigation to a simple monitoring process for the pilot and assures automatic approaches which split the runway centerline. Pilot's panel uses proposed ALPA or Collins "T" configuration. Note its center positioning of Collins

pproach horizon, course indicator nd second cross-pointer in conjunction with Collins omni-bearing selector for secondary omni or ILS. Two Collins 51 R-3 navigation receivers feed the integrated flight system and standby VOR-ILS, while dual-needle Bendix RMI furnishes constant VOR or ADF information. Narco DME is at bottom. Co-pilot panel uses standard SAE layout. Eyebrow panel carries all tuning heads and switches. Primary communications include 360-channel Collins 17L-4 transmitter simplexed with 360-channel Collins 51X-1 receiver. A 360-channel Narco 1016 Sapphire is standby. Dual Wilcox ADF heads at center above engine group are separated by autopilot trim indicator. Wilcox glideslope and marker beacon receivers are used. Power is by two 250-VA inverters.



This is the Hubinger Company's Super Aero Commander 680 custom panel featuring Collins integrated flight system and Collins AP-101 autopilot system. For details, see description in adjoining column.

Foster

Tom Foster, formerly assistant to the president of Southern Airways, is now vice president in charge of sales and contracts for **AERO CORP. OF ATLANTA**, large maintenance and modification center on Atlanta Municipal Airport. . . . All aircraft x-ray inspections by Aero Corp. of Atlanta are performed with film development on the premises for immediate analysis. If a film shows need for further x-raying, it can be done without delay to complete the job.

EXECUTIVE AIRCRAFT SERVICE, Garland Airport, Dallas, is installing double-length sliding cockpit windows in a Lodestar it is building up for sale, these being the largest sliding windows ever installed in a Lodestar. The airplane will also have four large cabin picture windows, measuring 17.5 by 56 ins. The entire nose section is new, its front shear beam lowered to give a smooth flight deck for larger crew chairs on tracks. . . . International Petroleum's executive Douglas B-23 from Lima, Peru, is at Executive Aircraft Service for partial interior, complete re-wiring, airframe overhaul, radar nose installation and stabilizer modification. Bill Corry is chief pilot, with W. H. Bowman accompanying the B-23 from South America as resident inspector for the project. . . . Other Executive Aircraft Service activity last month consisted mostly of routine maintenance and service work and periodic inspections for regular customers' DC-3's and Lodestars. ★ ★ ★

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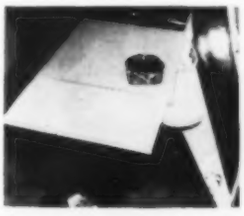

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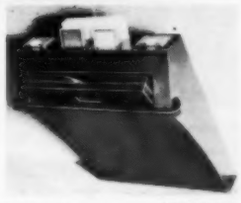

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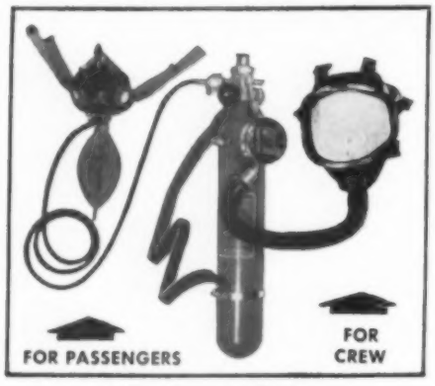

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VIENE MAR-LEEN!

(Continued from page 93)

Pacific, is a veritable Shangri-La. You might find something in its class on the island of Majorca in the Mediterranean. I don't know. Or on the French Riviera. But you couldn't find the same remoteness — the complete isolation and end-of-the-earth feeling of Palmilla.

We went primarily to fish — not to enjoy the facilities — though it's tough to determine now which was the most enjoyable. The fishing boats were just coming in the afternoon of our arrival. Before getting our bags to our rooms we went down on the dock and watched the process of unloading, weighing in and photographing of the catches. Every day we were there the boats went out in the morning and came back in the afternoon, always with big marlin aboard, many in the 200- to 300-pound class. "It's the same with sailfish during the season," one veteran customer of Las Cruces told us on the dock. "You have to see this to believe it!" As a result neither King nor I slept very well that night, anxiously awaiting the passage of time until Fisher's boat cast off at eight in the morning.

Heading out to the marlin "pasture," Fisher gave us a briefing on the proper way to hunt and catch the big billfish. After an hour's run at a good clip in the 29-footer, we heard the engine slow and knew it was time to put out the lines and the teaser. Juan and Alfonso, two brothers who made up our Mexican crew, baited the hooks with flying fish of a size that certainly would be keepers in the kind of fishing we usually do. Juan steered as Alfonso rigged up the lines, in our case 9-strand, 27-pound-test equipment, which looked mighty light to John King and me. But Fisher was boss and, realizing he once held the world's record for marlin on 3-strand, 9-pound-test, we proceeded confidently to help the Mexcan crewmen search for the fish, trolling along lazily in beautiful blue waters you see only in picture books.

Here's the resort strip at Palmilla. With its three per cent grade, landings are uphill from the water, regardless of wind.

Soon came the cry, "Viene Mar-leen! Viene Mar-leen!" The engine roared, the boat veered abruptly to starboard and sure enough, Juan and Alfonso had spotted a crescent tail snapping through the water. We turned for the collision course. The teaser was pulled in as the marlin spotted our baits skipping along the surface, angled back and forth between the two, dropped back, then came in with a lightning like strike on the bait of his choice — John King's. In came my line while John fought it out alone.

The giant fish pulled no punches, going hell-bent-for-leather with his morning breakfast in his gullet. The adept Juan threw the boat in reverse as he tried to make up for all the yards of line King had to give out. "This guy is headed for China!" King yelled as the reel sizzled. Then up came the behemoth, crashing through the sur-

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face, standing on his tail, trying hard to shake the hook. With Fisher's expert coaching, in about 20 minutes King was reeling in some line and holding it. After 30 minutes, though, it was doubtful who was going to give up first — the fish or the fisherman. But the expert boatman and the excited King won out. After one last long run and his fifth spectacular leap, Mr. Marlin started giving in. He was reeled to the stern of the boat, gaffed, noosed and loaded aboard.

Up went a marlin flag and out went the baited hooks and teaser again. We saw plenty of fish. But it was an hour before another hungry one came along. "Viene Mar-leen!" came the cry. This time Mother Fate guided him on to my line and the exciting process was repeated.

My fish was not as spectacular in the acrobatic department as John King's. But he was bigger and meaner. At least three times I would have bet all I owned he was going to take the line and rod and depart for depths unknown. But again, the expert boatmen and coach, Bob Fisher, handled the situation. Forty minutes later we had the monster alongside the stern and I was literally pooped.

As Alfonso reached down to grab the steel leader and Juan stood by with gaff, belaying pin and hawser, all hell broke loose. In a final, death-defying, powerful lurch, Mr. Marlin left the water and crashed headlong into the boat, his long spiked bill ripping 5 inches out of my shirt as I turned to escape what looked like certain impalement. Apparently our canny boatmen had been through such a melee before. With the aid of two gaffs, the billy club and a stout manila rope, the giant fish was soon out of commission and parked across the prow of the boat with the equally large one caught by the city editor of the Dallas Morning News.

"That's really livin'," said King in the prize understatement of the entire trip, as the second marlin flag went up the mast. I smiled wearily in agreement. You just haven't lived if you've never hooked a big billfish.

On the two subsequent days, we tested out the smaller game, fishing with lighter tackle in this universally-accepted greatest fishing hole on earth. Cabrillas, bonitos, pompano, sierra mackerel, fighting roosterfish, dolphin, grouper, redfish, pargo, yellow-tail, jackfish, snaappers — you just name it and the "Sea of Cortez" has it! John King caught sierra mackerel and jackfish on his spinning tackle and one afternoon we pulled in cabrilla, a beautiful brown speckled species of rock bass, until we were worn out. While the large majority of people fish here for the huge billfish like marlin and sails, we're of the school of opinion that expeditions for the endless millions of smaller fish are just as thrilling. That's saying a lot for there's nothing like that first marlin. They are hunted from April 1 through July, sails from the middle of May to October, at Las Cruces. At Palmilla, it's all year-round for the big bills.

Being veteran pilots, both Fisher and Rodriguez have built their two Lower California resorts around the airplane. Nearly all of the food and other necessities as well as the customers come by air. It is practically impossible to get there by car even though Rancho Las Cruces is only a 30-mile road trip by automobile from La Paz, a picturesque town of 16,000 people. It's eight minutes by Bonanza.

The Las Cruces strip is 3,700 feet long, north-south. Palmilla, on the tip of the peninsula, has a 3,500-foot strip with a three per cent grade which requires uphill landing and downhill take-off regardless of the wind. You come in over the water on the Palmilla approach. At Las Cruces you usually land into a breeze off the Gulf, entering from a wide canyon. But look out for traffic! These spots revolve around aircraft. Anything up to Lodestars and

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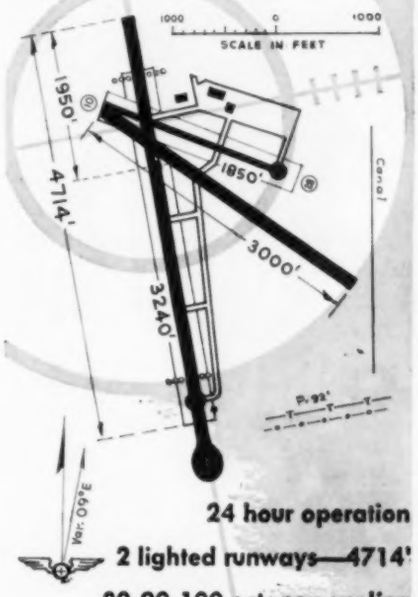

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DC-3's use the strips regularly and we saw both in operation. A week before our arrival a real sharp pilot brought in a Ventura but on that type of equipment we would suggest using the 5,000-ft. La Paz commercial airport and Fisher's Bonanza air taxi to the resort. Both strips offer complete fueling up to 100-octane.

We cleared through El Paso-Juarez going down but clearance can also be made at Douglas, Nogales or Tijuana. If you fly from California down the peninsula, there are plenty of fields all the way. From Juarez direct to Las Cruces we passed west of Chihuahua and directly over Los Mochis, both of which have full-time low frequency range stations. Over this route you can see some of the most rugged country in the Americas. About 75 miles is over the Grand Canyon of Mexico, rivaling in beauty our own Grand Canyon. We cleared everything at 10,000 feet. It's about 115 nautical miles across the Gulf from Los Mochis to Las Cruces strip.

La Paz, Los Mochis and Chihuahua weather was available at the El Paso terminal but weather and communications are almost nil in Mexico. La Paz has a commercial radio station around 800 kilocycles that can be used for ADF purposes.

If you don't fly down in your own airplane you can get to La Paz by one of two commercial airlines — Trans Mar de Cortez from Tijuana and Aeronaves de Mexico out of Juarez. The rates are reasonable. Single-engine ships should clear out of Douglas or Nogales and island-hop across the northern part of the Gulf, then down the peninsula coastline route west coasters take when clearing through Tijuana. World aeronautical charts 520 and 591 cover the peninsula.

There are only two months of bad weather, August and September, when Las Cruces closes down. The climate is unbelievably pleasant with days of brilliant sunshine (watch out for sunburn, even by reflection!) and cool nights under the stars. The big sierra that forms the backbone of the peninsula keeps the rain and fog along the Pacific coastline, leaving the Gulf coast generally splashed in sunlight.

At Las Cruces you can enjoy nearly every kind of recreation from skeet and golf driving to horseback riding and croquet. Excellent hunting for two long seasons each year is available with deer, quail and white wing dove practically unlimited. Mexico permits guns to be brought in (no two of the

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ame calibre) and two boxes of shells per firearm.

The rates are most reasonable. Room and meals are only $15 per day per person at Las Cruces and $15 and $20 per day at Palmilla. Vegetables are grown locally and all other foods are flown in weekly from California. The daily rates for the boats including crew, bait, ice and lunch are from $50 to $60, which is a bargain when split up by a fishing party. Fishing tackle can be rented if desired. Gratuities run about 5 per cent with no tipping at tables or bar. Both Las Cruces and Palmilla are the ultimate in luxury, charm and good taste.

For reservations, literature or any other inquiry, address air mail inquiries to Rancho Las Cruces, P. O. Box 40, La Paz, Baja California, Mexico. A wire gets through in a couple of days if you're lucky. Sometimes telephone calls can be put through by calling the Yacht Lynnita through the KMI marine radio telephone at Oakland, California. And if you are one of the fortunate few to get there, we guarantee that the famous fisherman's prayer asking to catch a fish so big, "that even I, when telling of it need never tell a lie," will come true!

EDITOR'S NOTE: For a real documentary by a professional writer-sportsman, we recommend Frank Dufresne's piece entitled "Mexico's Marvelous Sea" in the May, 1957, edition of "Field & Stream."

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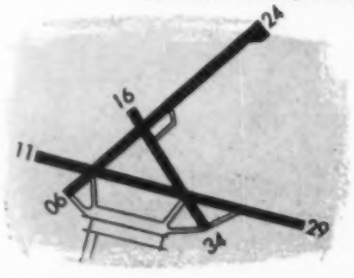

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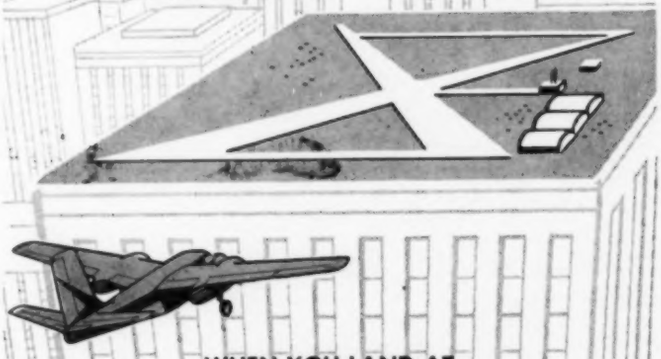

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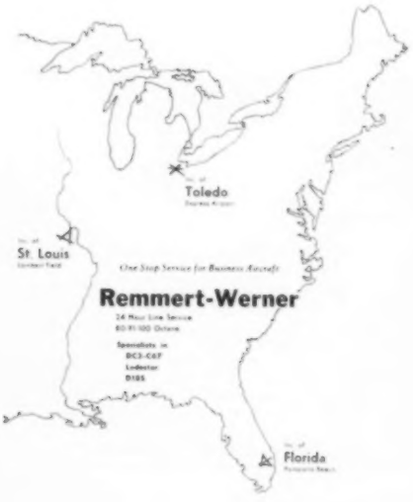

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